

MELSEC Q

Programmable Logic Controllers

User's Manual (Hardware)

QCPU (Q Mode)

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These SAFETY PRECAUTIONS classify the safety precautions into two categories: "DANGER" and "CAUTION".



DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Depending on circumstances, procedures indicated by ⚠ CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]



DANGER

- Install a safety circuit external to the PLC that keeps the entire system safe even when there are problems with the external power supply or the PLC module. Otherwise, trouble could result from erroneous output or erroneous operation.

- (1) Outside the PLC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward/reverse operations.
- (2) When the PLC detects the following problems, it will stop calculation and turn off all output in the case of (a). In the case of (b), it will stop calculation and hold or turn off all output according to the parameter setting.

Note that the AnS series module will turn off the output in either of cases (a) and (b).

- (a) The power supply module has over current protection equipment and over voltage protection equipment.
- (b) The PLC CPUs self-diagnostic functions, such as the watchdog timer error, detect problems.

In addition, all output will be turned on when there are problems that the PLC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PLC that will make sure the equipment operates safely at such times. See section 8.1 of this manual for example fail safe circuits.

- (3) Output could be left on or off when there is trouble in the outputs module relay or transistor. So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.

[DESIGN PRECAUTIONS]

DANGER

- When overcurrent which exceeds the rating or caused by short-circuited load flows in the output module for a long time, it may cause smoke or fire. To prevent this, configure an external safety circuit, such as fuse.
- Build a circuit that turns on the external power supply when the PLC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.
- When there are communication problems with the data link, refer to the corresponding data link manual for the operating status of each station. Not doing so could result in erroneous output or erroneous operation.

- When connecting a peripheral device to the CPU module or connecting a personal computer or the like to the intelligent function module to exercise control (data change) on the running PLC, configure up an interlock circuit in the sequence program to ensure that the whole system will always operate safely.

Also before exercising other control (program change, operating status change (status control)) on the running PLC, read the manual carefully and fully confirm safety.

Especially for the above control on the remote PLC from an external device, an immediate action may not be taken for PLC trouble due to a data communication fault.

In addition to configuring up the interlock circuit in the sequence program, corrective and other actions to be taken as a system for the occurrence of a data communication fault should be predetermined between the external device and PLC CPU.

CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100 mm (3.94 inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.
- When controlling items like lamp load, heater or solenoid valve using an output module, large current (approximately ten times greater than that present in normal circumstances) may flow when the output is turned OFF to ON.
Take measures such as replacing the module with one having sufficient rated current.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PLC in an environment that meets the general specifications contained in this manual. Using this PLC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Hold down the module loading lever at the module bottom, and securely insert the module fixing hook into the fixing hole in the base unit. Incorrect loading of the module can cause a malfunction, failure or drop.
When using the PLC in the environment of much vibration, tighten the module with a screw. Tighten the screw in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to damage to the screw or module.
- When installing extension cables, be sure that the connectors of base unit are installed correctly. After installation, check them for looseness. Poor connections could cause an input or output failure.
- Securely load the memory card into the memory card loading connector. After loading, check for lifting. Lifting can cause a malfunction due to a contact fault.
- Completely turn off the external power supply before loading or unloading the module. Not doing so could result in electric shock or damage to the product.
- Do not directly touch the module's conductive parts or electronic components. Touching the conductive parts could cause an operation failure or give damage to the module.

[WIRING PRECAUTIONS]

DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

[WIRING PRECAUTIONS]

CAUTION

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PLC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. Imperfect connections could result in short circuit, fires, or erroneous operation.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation. Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- The module has an ingress prevention label on its top to prevent foreign matter, such as wire offcuts, from entering the module during wiring.
Do not peel this label during wiring.
Before starting system operation, be sure to peel this label because of heat dissipation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminals while power is on.
Doing so could cause shock or erroneous operation.
- Correctly connect the battery. Also, do not charge, disassemble, heat, place in fire, short circuit, or solder the battery. Mishandling of battery can cause overheating or cracks which could result in injury and fires.
- Switch all phases of the external power supply off when cleaning the module or retightening the terminal or module mounting screws. Not doing so could result in electric shock.
Undertightening of terminal screws can cause a short circuit or malfunction. Overtightening of screws can cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- The online operations conducted for the CPU module being operated, connecting the peripheral device (especially, when changing data or operation status), shall be conducted after the manual has been carefully read and a sufficient check of safety has been conducted.
Operation mistakes could cause damage or problems with of the module.
- Do not disassemble or modify the modules.
Doing so could cause trouble, erroneous operation, injury, or fire.
- Use any radio communication device such as a cellular phone or a PHS phone more than 25cm (9.85 inch) away from the PLC.
Not doing so can cause a malfunction.
- Switch all phases of the external power supply off before mounting or removing the module.
If you do not switch off the external power supply, it will cause failure or malfunction of the module.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.

REVISIONS

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INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-Q Series of General Purpose Programmable Controllers. Please read this manual carefully so that equipment is used to its optimum.

CONTENTS

SAFETY PRECAUTIONS	A- 1
REVISIONS	A- 6
CONTENTS	A- 7
About Manuals	A-17
How to Use This Manuals	A-18
About the Generic Terms and Abbreviations	A-19

1. OVERVIEW	1- 1 to 1- 4
-------------	--------------

1.1 Overview	1- 1
1.2 Features	1- 2

2. SYSTEM CONFIGURATION FOR SINGLE CPU SYSTEM	2- 1 to 2- 6
---	--------------

2.1 System Configuration	2- 1
2.2 Precaution on System Configuration	2- 4
2.3 Confirming the Serial Numbers and Function Versions	2- 6

3. GENERAL SPECIFICATIONS	3- 1 to 3- 2
---------------------------	--------------

4. HARDWARE SPECIFICATION OF THE CPU MODULE	4- 1 to 4- 9
---	--------------

4.1 Performance Specification	4- 1
4.2 Part Names and Settings	4- 4
4.3 Switch Operation After Writing in Program	4- 7
4.4 Latch Clear Operation	4- 8
4.5 Executing automatic write to standard ROM	4- 8

5. POWER SUPPLY MODULE	5- 1 to 5- 8
------------------------	--------------

5.1 Specification	5- 1
5.1.1 Power supply module specifications	5- 1
5.1.2 Selecting the power supply module	5- 4
5.1.3 Precaution when connecting the uninterruptive power supply	5- 5
5.2 Names of Parts and Settings	5- 6

6. BASE UNIT AND EXTENSION CABLE	6- 1 to 6- 10
----------------------------------	---------------

6.1 Base Unit Specification Table	6- 1
6.2 Extension Cable Specification Table	6- 2
6.3 The Names of The Parts of The Base Unit	6- 3
6.4 Setting the Extension Base Unit	6- 5

6.5 Input/output Number Allocation	6- 6
6.6 Guideline for Use of Extension Base Units (Q5□B)	6- 7

7. MEMORY CARD AND BATTERY	7- 1 to 7- 6
-----------------------------------	---------------------

7.1 Memory Card Specifications	7- 1
7.2 Battery Specifications (For CPU Module and SRAM Card)	7- 2
7.3 Handling the Memory Card	7- 3
7.4 The Names of The Parts of The Memory Card	7- 4
7.5 Memory Card Loading/Unloading Procedures	7- 5
7.6 Installation of Battery (for CPU Module and Memory Card)	7- 6

8. EMC AND LOW-VOLTAGE DIRECTIVES	8- 1 to 8-11
--	---------------------

8.1 Requirements for conformance to EMC Directive	8- 1
8.1.1 Standards applicable to the EMC Directive	8- 1
8.1.2 Installation instructions for EMC Directive	8- 2
8.1.3 Cables	8- 3
8.1.4 Power supply module	8- 5
8.1.5 When using Q1AS6 □ B type base unit	8- 5
8.1.6 Others	8- 8
8.2 Requirement to Conform to the Low-Voltage Directive	8- 9
8.2.1 Standard applied for MELSEC-Q series PLC	8- 9
8.2.2 MELSEC-Q series PLC selection	8- 9
8.2.3 Power supply	8- 10
8.2.4 Control box	8- 10
8.2.5 Grounding	8- 11
8.2.6 External wiring	8- 11

9. LOADING AND INSTALLATION	9- 1 to 9-25
------------------------------------	---------------------

9.1 General Safety Requirements	9- 1
9.2 Calculating Heat Generation by PLC	9- 6
9.3 Module Installation	9- 9
9.3.1 Precaution on installation	9- 9
9.3.2 Instructions for mounting the base unit	9-12
9.3.3 Installation and removal of module	9-14
9.4 How to Set Extension Numbers for the Extension Base Unit	9-18
9.5 Connection and Disconnection of Extension Cable	9-19
9.6 Wiring	9-22
9.6.1 The precautions on the wiring	9-22
9.6.2 Connecting to the power supply module	9-25

10. MAINTENANCE AND INSPECTION	10- 1 to 10- 7
---------------------------------------	-----------------------

10.1 Daily Inspection	10- 2
10.2 Periodic Inspection	10- 3
10.3 Battery Replacement	10- 4
10.3.1 Battery service life	10- 5

10.3.2 Battery replacement procedure	10- 6
--	-------

11. TROUBLESHOOTING	11- 1 to 11-97
---------------------	----------------

11.1 Troubleshooting Basics	11- 1
11.2 Troubleshooting	11- 2
11.2.1 Troubleshooting flowchart.....	11- 2
11.2.2 Flowchart for when "MODE" LED is not turned on	11- 3
11.2.3 When "MODE" LED is flashing.....	11- 4
11.2.4 Flowchart for when "POWER" LED is turned off	11- 5
11.2.5 Flowchart for when the "RUN" LED is turned off	11- 6
11.2.6 When the "RUN" LED is flashing.....	11- 6
11.2.7 Flowchart for when "ERR." LED is on/flashing	11- 7
11.2.8 When "USER" LED is turned on.....	11- 8
11.2.9 When "BAT.ARM" LED is turned on.....	11- 8
11.2.10 When "BOOT" LED is flashing	11- 9
11.2.11 When output module LED is not turned on	11-10
11.2.12 Flowchart for when output load of output module does not turn on	11-11
11.2.13 Flowchart for when unable to read a program	11-12
11.2.14 Flowchart for when unable to write a program.....	11-13
11.2.15 Flowchart for when it is unable to perform boot operation from memory card	11-15
11.2.16 Flowchart for when UNIT VERIFY ERR. occurs.....	11-16
11.2.17 Flowchart for when CONTROL BUS ERR. occurs.....	11-17
11.3 Error Code List.....	11-18
11.3.1 Procedure for reading error codes.....	11-18
11.3.2 Error code list	11-19
11.4 Canceling of Errors	11-37
11.5 I/O Module Troubleshooting	11-38
11.5.1 Input circuit troubleshooting	11-38
11.5.2 Output circuit troubleshooting	11-40
11.6 Special Relay List.....	11-41
11.7 Special Register List	11-62

APPENDICES	App- 1 to App-13
------------	------------------

APPENDIX 1 Error Code Return to Origin During General Data Processing.....	App- 1
APPENDIX 1.1 Error code overall explanation	App- 1
APPENDIX 1.2 Description of the errors of the error codes (4000H to 4FFFH)	App- 2
APPENDIX 2 External Dimensions Diagram	App- 7
APPENDIX 2.1 CPU module	App- 7
APPENDIX 2.2 Power supply module	App- 8
APPENDIX 2.3 Main base unit	App- 9
APPENDIX 2.4 Extension base unit	App-11

INDEX	Index- 1 to Index- 2
-------	----------------------

CONTENTS

1. OVERVIEW

- 1.1 Features
- 1.2 Programs
- 1.3 Convenient Programming Devices and Instructions

2. SYSTEM CONFIGURATION FOR SINGLE CPU SYSTEM

- 2.1 System Configuration
- 2.2 Precaution on System configuration
- 2.3 Confirming the Serial No. and Function Versions

3. PERFORMANCE SPECIFICATION

4. SEQUENCE PROGRAM CONFIGURATION & EXECUTION CONDITIONS

- 4.1 Sequence Program
 - 4.1.1 Main routine program
 - 4.1.2 Sub-routine programs
 - 4.1.3 Interrupt programs
- 4.2 Program Execute Type
 - 4.2.1 Initial execution type program
 - 4.2.2 Scan execution type program
 - 4.2.3 Low-speed execution type program
 - 4.2.4 Stand-by type program
 - 4.2.5 Fixed scan execution type program
- 4.3 Operation processing
 - 4.3.1 Initial processing
 - 4.3.2 I/O refresh (I/O module refresh processing)
 - 4.3.3 Automatic refresh of the intelligent function module
 - 4.3.4 END processing
- 4.4 RUN, STOP, PAUSE Operation Processing
- 4.5 Operation Processing during Momentary Power Failure
- 4.6 Data Clear Processing
- 4.7 Input/Output Processing and Response Lag
 - 4.7.1 Refresh mode
 - 4.7.2 Direct mode
- 4.8 Numeric Values which Can Be Used in Sequence Programs
 - 4.8.1 BIN (Binary code)
 - 4.8.2 HEX (Hexadecimal)
 - 4.8.3 BCD (Binary Coded Decimal)

(Related manual) High Performance model QCPU (Q Mode) User's Manual
(Function Explanation, Program Fundamentals)

- 4.8.4 Real numbers (floating decimal point data)
- 4.9 Character String Data

5. ASSIGNMENT OF I/O NUMBERS

- 5.1 Relationship Between the Number of Stages and Slots of the Extension Base Unit
- 5.2 Installing Extension Base Units and Setting the Number of Stages
- 5.3 Base Unit Assignment (Base Mode)
- 5.4 What are I/O Numbers?
- 5.5 Concept of I/O Number Assignment
 - 5.5.1 I/O numbers of main base unit and extension base units
 - 5.5.2 Remote station I/O number
- 5.6 I/O Assignment by GX Developer
 - 5.6.1 Purpose of I/O assignment by GX Developer
 - 5.6.2 Concept of I/O assignment using GX Developer
- 5.7 Examples of I/O Number Assignment
- 5.8 Checking the I/O Numbers

6. HIGH PERFORMANCE MODEL QCPU FILES

- 6.1 About the High Performance model QCPU's Memory
- 6.2 Program Memory
- 6.3 About the Standard ROM
- 6.4 About the Standard RAM
- 6.5 Memory Card
- 6.6 Writing Data in the Standard ROM or on the Flash Card
 - 6.6.1 Writing Data in the standard ROM or on the flash card using the GX developer
 - 6.6.2 Automatic writing in the standard ROM (automatically writing all data from the memory card to the standard ROM)
- 6.7 Executing Standard ROM/Memory Card Programs (Boot Run)
- 6.8 Program File Configuration
- 6.9 GX Developer File Operation and File Handling Precautions
 - 6.9.1 File operation
 - 6.9.2 File handling precautions
 - 6.9.3 File size

7. FUNCTION

- 7.1 Function List
- 7.2 Constant Scan
- 7.3 Latch Functions
- 7.4 Setting the Output (Y) Status when Changing from STOP Status to RUN Status
- 7.5 Clock Function

(Related manual) High Performance model QCPU (Q Mode) User's Manual
(Function Explanation, Program Fundamentals)

- 7.6 Remote Operation
 - 7.6.1 Remote RUN/STOP
 - 7.6.2 Remote PAUSE
 - 7.6.3 Remote RESET
 - 7.6.4 Remote latch clear
 - 7.6.5 Relationship of the remote operation and High Performance model QCPU RUN/STOP switch
- 7.7 Selecting the Response Time of the Q series Compatible Input Module and Interrupt Module (I/O Response Time)
 - 7.7.1 Selecting the response time of the input module
 - 7.7.2 Selecting the response time of the high-speed input module
 - 7.7.3 Selecting the response time of the interrupt module
- 7.8 Setting the Switches of the Intelligent Function Module
- 7.9 Monitoring Function
 - 7.9.1 Monitor condition setting
 - 7.9.2 Monitoring test for local device
 - 7.9.3 Forced ON/OFF of external I/O
- 7.10 Writing in Program during High Performance model QCPU RUN
 - 7.10.1 Writing data in the circuit mode during the RUN status
 - 7.10.2 Writing a batch of files during RUN
- 7.11 Execution Time Measurement
 - 7.11.1 Program monitor list
 - 7.11.2 Interrupt program monitor list
 - 7.11.3 Scan time measurement
- 7.12 Sampling Trace Function
- 7.13 Debug Function with Multiple Users
 - 7.13.1 Multiple-user monitoring function
 - 7.13.2 Multiple-user RUN write function
- 7.14 Watchdog Timer (WDT)
- 7.15 Self-Diagnosis Function
 - 7.15.1 Interrupt due to error occurrence
 - 7.15.2 LED display when error occurs
 - 7.15.3 Cancel error
- 7.16 Failure History
- 7.17 System Protect
 - 7.17.1 Password registration
 - 7.17.2 Remote password
- 7.18 Monitoring High Performance model QCPU System Status from GX Developer (System Monitor)
- 7.19 LED Display
 - 7.19.1 LED display
 - 7.19.2 Priority setting

(Related manual) High Performance model QCPU (Q Mode) User's Manual
(Function Explanation, Program Fundamentals)

8. COMMUNICATION WITH INTELLIGENT FUNCTION MODULE/SPECIAL FUNCTION MODULE

- 8.1 Communication Between High Performance model QCPU and Q-series Intelligent Function Modules
 - 8.1.1 Initial setting and automatic refresh setting using GX Configurator
 - 8.1.2 Communication using device initial value
 - 8.1.3 Communication using FROM/TO instruction
 - 8.1.4 Communication using the intelligent function module device
 - 8.1.5 Communication using the instructions dedicated for intelligent function modules
- 8.2 Request from Intelligent Function Module to High Performance model QCPU
 - 8.2.1 Interrupt from the intelligent function module
- 8.3 Communication Between High Performance model QCPU and AnS-Series Special Function Modules
 - 8.3.1 Communication using device initial value
 - 8.3.2 Communication using FROM/TO instruction
 - 8.3.3 Communication using the intelligent function module device
 - 8.3.4 Effects of quicker access to the special function module and countermeasures against them

9. PARAMETER LIST

10. DEVICES

- 10.1 Device List
- 10.2 Internal User Devices
 - 10.2.1 Inputs (X)
 - 10.2.2 Outputs (Y)
 - 10.2.3 Internal relays (M)
 - 10.2.4 Latch relays (L)
 - 10.2.5 Annunciators (F)
 - 10.2.6 Edge relay (V)
 - 10.2.7 Link relays (B)
 - 10.2.8 Special link relays (SB)
 - 10.2.9 Step relays (S)
 - 10.2.10 Timers (T)
 - 10.2.11 Counters (C)
 - 10.2.12 Data registers (D)
 - 10.2.13 Link registers (W)
 - 10.2.14 Special link registers (SW)
- 10.3 Internal System Devices
 - 10.3.1 Function devices (FX, FY, FD)
 - 10.3.2 Special relays (SM)
 - 10.3.3 Special registers (SD)
- 10.4 Link Direct Devices (J[][])

(Related manual) High Performance model QCPU (Q Mode) User's Manual
(Function Explanation, Program Fundamentals)

10.5 Intelligent Function Module Devices (U□\G□)

10.6 Index Registers (Z)

10.6.1 Switching between scan execution type programs and low-speed execution type programs

10.6.2 Switching between scan/low-speed execution programs and interrupt/fixed scan execution type programs

10.7 File Registers (R)

10.7.1 File register capacity

10.7.2 Differences in memory card access method by memory card type

10.7.3 Registering the file registers

10.7.4 File register designation method

10.7.5 Precautions in using file registers

10.8 Nesting (N)

10.9 Pointers

10.9.1 Local pointers

10.9.2 Common pointers

10.10 Interrupt Pointers (I)

10.11 Other Devices

10.11.1 SFC block device (BL)

10.11.2 SFC transition device (TR)

10.11.3 Network No. designation device (J)

10.11.4 I/O No. designation device (U)

10.11.5 Macro instruction argument device (VD)

10.12 Constants

10.12.1 Decimal constants (K)

10.12.2 Hexadecimal constants (H)

10.12.3 Real numbers (E)

10.12.4 Character string (" ")

10.13 Convenient Uses for Devices

10.13.1 Global devices & local devices

10.13.2 Device initial values

11 HIGH PERFORMANCE MODEL QCPU PROCESSING TIME

11.1 Reading High Performance model QCPU's Scan Time

11.2 Factors Responsible for Extended Scan Time

Factors Responsible for Shortened Scan Time

12 PROCEDURE FOR WRITING PROGRAMS TO HIGH PERFORMANCE MODEL QCPU

12.1 Writing Procedure for 1 Program

12.1.1 Items to consider when creating one program

12.1.2 Procedure for writing programs to the High Performance model QCPU

12.2 Procedure for Multiple Programs

12.2.1 Items to consider when creating multiple programs

12.2.2 Procedure for writing programs to the High Performance model QCPU

13 OUTLINE OF MULTIPLE PLC SYSTEMS

- 13.1 Features
- 13.2 Outline of Multiple PLC Systems
- 13.3 Differences with Single CPU Systems

14 SYSTEM CONFIGURATION OF MULTIPLE PLC SYSTEMS

- 14.1 System Configuration
- 14.2 Precautions During Multiple PLC System Configuration
 - 14.2.1 Function versions of High Performance model QCPU , motion CPUs and PC CPU module that can be used, and their mounting positions
 - 14.2.2 Precautions when using Q series corresponding I/O modules and intelligent function modules
 - 14.2.3 Limitations when mounting AnS series corresponding I/O modules and special function modules
 - 14.2.4 Modules that have mounting restrictions
 - 14.2.5 Usable GX Developers and GX Configurators
 - 14.2.6 Parameters that enable the use of multiple PLC systems
 - 14.2.7 Resetting the multiple PLC system
 - 14.2.8 Processing when High Performance model QCPU stop errors occur
 - 14.2.9 Reducing the time required for multiple PLC system processing

15 ALLOCATING MULTIPLE PLC SYSTEM I/O NUMBERS

- 15.1 Concept behind Allocating I/O Numbers
 - 15.1.1 I/O modules and intelligent function module I/O numbers
 - 15.1.2 I/O number of High Performance model QCPU, Motion CPU and PC CPU module
- 15.2. Purpose of PC Parameter I/O Allocations with the GX Developer

16 COMMUNICATION BETWEEN THE MULTIPLE PLC SYSTEM'S QCPUS AND MOTION CPUs

- 16.1 Automatic Refresh of Common CPU Memory
- 16.2 Communication with Multiple PLC Commands and Intelligent Function Module Devices
- 16.3 Interactive Communications between The QCPU and Motion CPU
 - 16.3.1 Control instructions from the QCPU to the motion CPU
 - 16.3.2 Reading and writing device data
- 16.4 Common CPU Memory

17 COMMUNICATIONS BETWEEN THE MULTIPLE PLC SYSTEM'S I/O MODULES AND INTELLIGENT FUNCTION MODULES

- 17.1 Range of Control PLC Communications
- 17.2 Range of Non-control PLC Communications

(Related manual) High Performance model QCPU (Q Mode) User's Manual
(Function Explanation, Program Fundamentals)

18 PROCESSING TIME FOR MULTIPLE PLC SYSTEM HIGH PERFORMANCE MODEL QCPUs

- 18.1 Concept behind QCPU Scanning Time
- 18.2 Factor to Prolong the Scan Time

19 STARTING UP THE MULTIPLE PLC SYSTEM

- 19.1 Flow-chart for Starting Up the Multiple PLC System
- 19.2 Setting Up the Multiple PLC System Parameters (Multiple PLC Settings, Control PLC Settings)
 - 19.2.1 System configuration
 - 19.2.2 Creating new systems
 - 19.2.3 Using existing preset multiple PLC settings and I/O allocations

APPENDICES

- APPENDIX 1 Special Relay List
- APPENDIX 2 Special Register List
- APPENDIX 3 List of Interrupt Pointer Nos. & Interrupt Factors

INDEX

About Manuals

The following manuals are related to this product.

Referring to this list, please request the necessary manuals.

Related Manuals

Manual Name	Manual Number (Model Code)
High Performance model QCPU (Q Mode) User's Manual (Function Explanation/Program Fundamentals) This manual explains the functions, programming methods, devices and so on necessary to create programs with the High Performance model QCPU (Q mode). (Optional)	SH-080038 (13JL98)
QCPU (Q Mode)/QnA Programming Manual (Common Instructions) This manual describes how to use the sequence instructions, basic instructions and application instructions. (Optional)	SH-080039 (13JF58)
QCPU (Q Mode)/QnA Programming Manual (PID Control) This manual describes the dedicated instructions used to exercise PID control. (Optional)	SH-080040 (13JF59)
QCPU (Q Mode)/QnA Programming Manual (SFC) This manual explains the system configuration, performance specifications, functions, programming, debugging, error codes and others of MELSAP3. (Optional)	SH-080041 (13JF60)
QCPU (Q Mode)/QnA Programming Manual (MELSAP-L) This manual describes the programming methods, specifications, functions, and so on that are necessary to create the MELSAP-L type SFC programs. (Optional)	SH-080076 (13JF61)

How to Use This Manual

This manual is prepared for users to understand the hardware specifications of those modules such as the CPU modules, power modules, and base units, maintenance and inspections of the system, and troubleshooting required when you use MELSEC-Q series PLCs.

The manual is classified roughly into three sections as shown below.

- 1) Chapters 1 and 2 Describe the outline of the CPU module and the system configuration.
The basics of the system configuration of CPU module are described.
- 2) Chapters 3 to 7 Describe the general specifications indicating the operating environments of the CPU module, power module, and base units, and the performance specifications of these modules.
- 3) Chapters 8 to 10 Describe the overall maintenance such as the installation of the CPU module, daily inspections, and troubleshooting.

REMARK

This manual does not explain the functions of the CPU module.
For these functions, refer to the manual shown below.

- High Performance model QCPU (Q Mode) User's Manual (Function Explanation/Program Fundamentals)

About the Generic Terms and Abbreviations

This manual uses the following general names and abbreviations in the descriptions of the High Performance model QCPU unless otherwise specified.

Generic Term/Abbreviation	Description
High Performance model QCPU	General name for Q02CPU, Q02HCPU, Q06HCPU Q12HCPU, and Q25HCPU modules.
Q Series	Abbreviation for Mitsubishi MELSEC-Q Series General Purpose Programmable Controller.
AnS Series	Abbreviation for small types of Mitsubishi MELSEC-A Series General Purpose Programmable Logic Controller.
GX Developer	General name for GX Developer Version 4 or later.
Main base unit Q3□B	General name for Q33B, Q35B, Q38B, Q312B type main base unit with Q Series power module, input/output module and intelligent function module attachable.
Extension base unit	General name for Q5□B, Q6□B and QA1S6□B.
Q5□B	General name for Q52B and Q55B type extension base unit with Q Series input/output module and intelligent function module attachable.
Q6□B	General name for Q65B, Q68B and Q612B type extension base unit with Q Series power module, input/output module and intelligent function module attachable.
QA1S6□B	General name for QA1S65B and QA1S68B type extension base unit with AnS Series power module, input/output module and special function module attachable.
Base unit	General name for Main base unit and extension base unit.
SRAM card	Abbreviation for Q2MEM-1MBS type SRAM card.
Flash card	General name for Q2MEM-2MBS and Q2MEM-4MBS types Flash card.
ATA card	General name for Q2MEM-8MBS, Q2MEM-16MBS and Q2MEM-32MBS types ATA card.
Memory card	General name for SRAM card, Flash card and ATA card.
Power supply module	General name for Q61P-A1, Q61P-A2, Q62P, Q63P, A1S61PN, A1S62P and A1S63P types power supply module.
Battery	General name for battery for Q6BAT type CPU module and Q2MEM-BAT type SRAM card.
Extension cable	General name for QC05B, QC06B, QC12B, QC30B, QC50B, QC100B type extension cable.

1. OVERVIEW

1

1.1 Overview

This User's Manual describes the hardware specifications and handling methods of the PLCs Models Q02CPU/Q02HCPU/Q06HCPU/Q12HCPU/Q25HCPU.

The Manual also describes those items related to the specifications of the power supply module, main base unit, extension base unit, extension cable, memory card, and battery.

(1) Additional functions with products whose first 5 digits of the serial number are "02092"

The following functions have been added to the High Performance model QCPU products whose first 5 digits of the serial number are "02092."

- Automatic write to standard ROM
- External I/O can be turned ON/OFF forcibly
- Remote password setting
- Q12HCPU, Q25HCPU's increased standard RAM capacity
- MELSECNET/H remote I/O network compatibility
- Interrupt module (QI60) compatibility

(2) Additional functions with products whose function version is B

The following functions have been added to the High Performance Model QCPU products whose function version is B.

- Applicability to the multiple-PLC system

(3) Additional functions with products whose first 5 digits of the serial number are "03051"

- Installation of PC CPU unit into the multiple-PLC system

POINT
(1) For the details of the following additional functions, refer to the High Performance model QCPU (Q mode) User's Manual (Function Explanation, Program Fundamentals). • Additional functions with products whose first 5 digits of the serial No. are "02092" • Additional functions with products whose function version is B • Additional functions with products whose first 5 digits of the serial No. are "03051"
(2) Refer to Section 2.3 for the serial No. and function version of the High Performance model QCPU.

1.2 Features

1

High Performance model QCPU has the following new features:

(1) Controllable multiple I/O points

All High Performance model QCPUs support 4096 points (X/YO to FFF) as the number of actual I/O points capable of getting access to the I/O module installed on the base unit.

They also support 8192 points max. (X/YO to 1FFF) as the number of I/O devices which can be used in the remote I/O stations such as MELSECNET/H remote I/O NET, CC-Link data link and MELSECNET/MINI-S3 data link.

(2) Lineup according to program capacity

The optimum CPU module for the program capacity to be used can be selected.

Q02CPU, Q02HCPU	: 28k step
Q06HCPU	: 60k step
Q12HCPU	: 124k step
Q25HCPU	: 252k step

(3) Realised high speed processing

Depending on the type of the sequencer, high-speed processing has been realized.(Example: when LD instruction is used)

Q02CPU	: 0.079μs
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU	: 0.034μs

In addition, an access to the intelligent function module or an increase in speed of the link refresh of the network have been realized by the connection system (System bus connection) of the newly developed base unit.

Access to the intelligent function module : 20μs /word (approx. 7 times)*1

MELSECNET/H link refresh processing : 4.6ms/8k word (approx. 4.3 times)*1

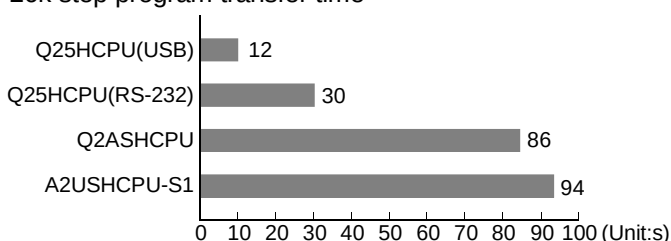
*1: Where Q02HCPU is compared with Q2ASHCPU-S1.

(4) Increase in debugging efficiency through high-speed communication with GX Developer

In the High Performance model QCPU, a time required for writing/reading of a program or monitoring has been reduced through the high speed communication at a speed of 115.2kbps max. by the RS-232, and a communication time efficiency at the time of debugging has been increased.

In the Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU, a high-speed communication at a speed of 12Mbps is allowed through the USB.

26k step program transfer time



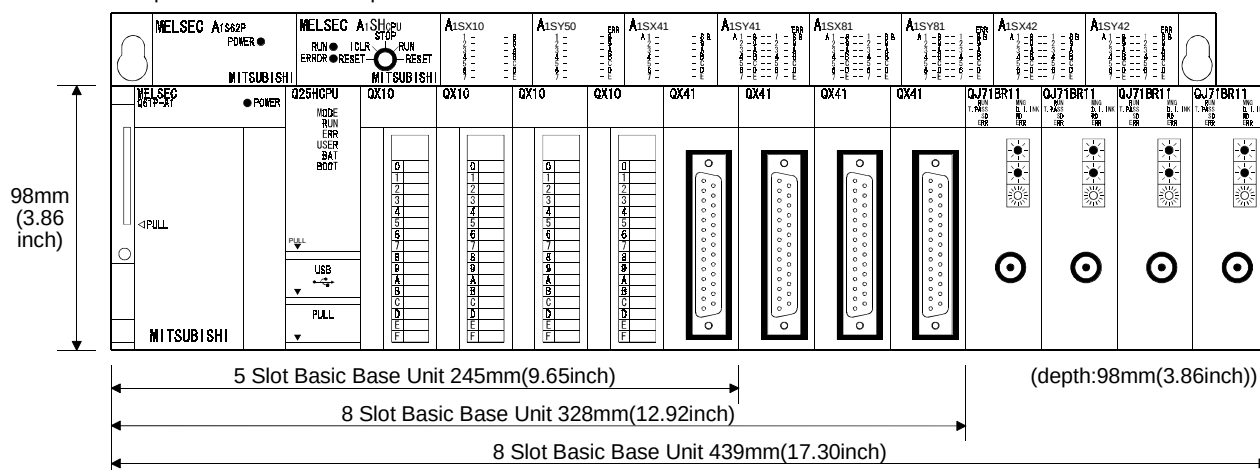
(5) AnS series I/O module or special function module are available.

For Q series, if an appropriate module is not available, the AnS series I/O module or special function module can also be used for the High Performance model QCPU through the use of the QA1S65B/QA1S68B extension base unit.

(6) Saved space by a reduction in size

The installation space for Q series has been reduced by approx. 60 % of the space for AnS series.

Comparison of installation space



(7) Connection of up to seven extension base units.

- The High Performance model QCPU can connect to seven extension base units (eight base units including the main) and accept up to 64 modules.
- The overall distance of the extension cables is up to 13.2m to ensure high degree of extension base unit arrangement.

(8) Memory extension by memory card

The High Performance model QCPU is provided with a memory card installation connector to which a memory card of 32 Mbyte max. can be connected (32 Mbyte is available when a ATA card is used).

When a memory card of large capacity is installed, a large capacity of file can be controlled, comments to all data devices can be set up, and the programs in the past can be stored in the memory as they are in the form of the corrected histories.

If a memory card is not installed, a program can be stored onto the standard ROM built in the High Performance model QCPU, and 32k/128k points of file registers can be handled by the standard RAM.

(9) Data can be written automatically to standard ROM

You need not use GX Developer to write parameters/programs on a memory card to the standard ROM of the High Performance model QCPU. When the standard ROM is used to perform ROM operation, you can load a memory card into the High Performance model QCPU and write parameters/programs on the memory card to the standard ROM. Hence, you need not carry GX Developer (personal computer) to rewrite the parameters/programs.

REMARK

*: File registers as big as 128k points can be handled by the Q12H CPU and Q25H CPU whose function version is B.

The total size of file registers of the Q02CPU, Q02H CPU, Q06H CPU, and Q12H CPU and Q25H CPU whose function version is A is 32k points.

(10) External I/O can be turned ON/OFF forcibly

If the High Performance model QCPU is in the RUN mode, you can operate GX Developer to turn external inputs/outputs ON/OFF forcibly, independently of the program execution status.

You need not put the High Performance model QCPU in the STOP mode to perform wiring/operation tests by forced ON/OFF of outputs.

(11) Remote password can be set

When access to an Ethernet module or serial communication module is made externally, whether access to the High Performance model QCPU can be made or not can be selected with a remote password.

(12) Remote I/O network of MELSECNET/H can be configured

You can load the remote master station of the MELSECNET/H to configure an MELSECNET/H remote I/O system.

REMARK

- Features (9) to (12) are functions added to the High Performance model QCPU whose serial number is "02092" or later in its upper 5 digits.
- The remote password facility can be executed when the Ethernet module or serial communication module of function version B and GX Developer Version 6 or later are used.
- In addition to the remote password, there are the following protection facilities for the High Performance model QCPU.
 - Protection of the whole CPU by making system settings of the High Performance model QCPU
 - Protection of the memory card by setting the write protect switch of the memory card
 - File-by-file protection using password
- The MELSECNET/H remote I/O network facility can be executed when the MELSECNET/H network module of function version B and GX Developer (Version 6 or later) are used.

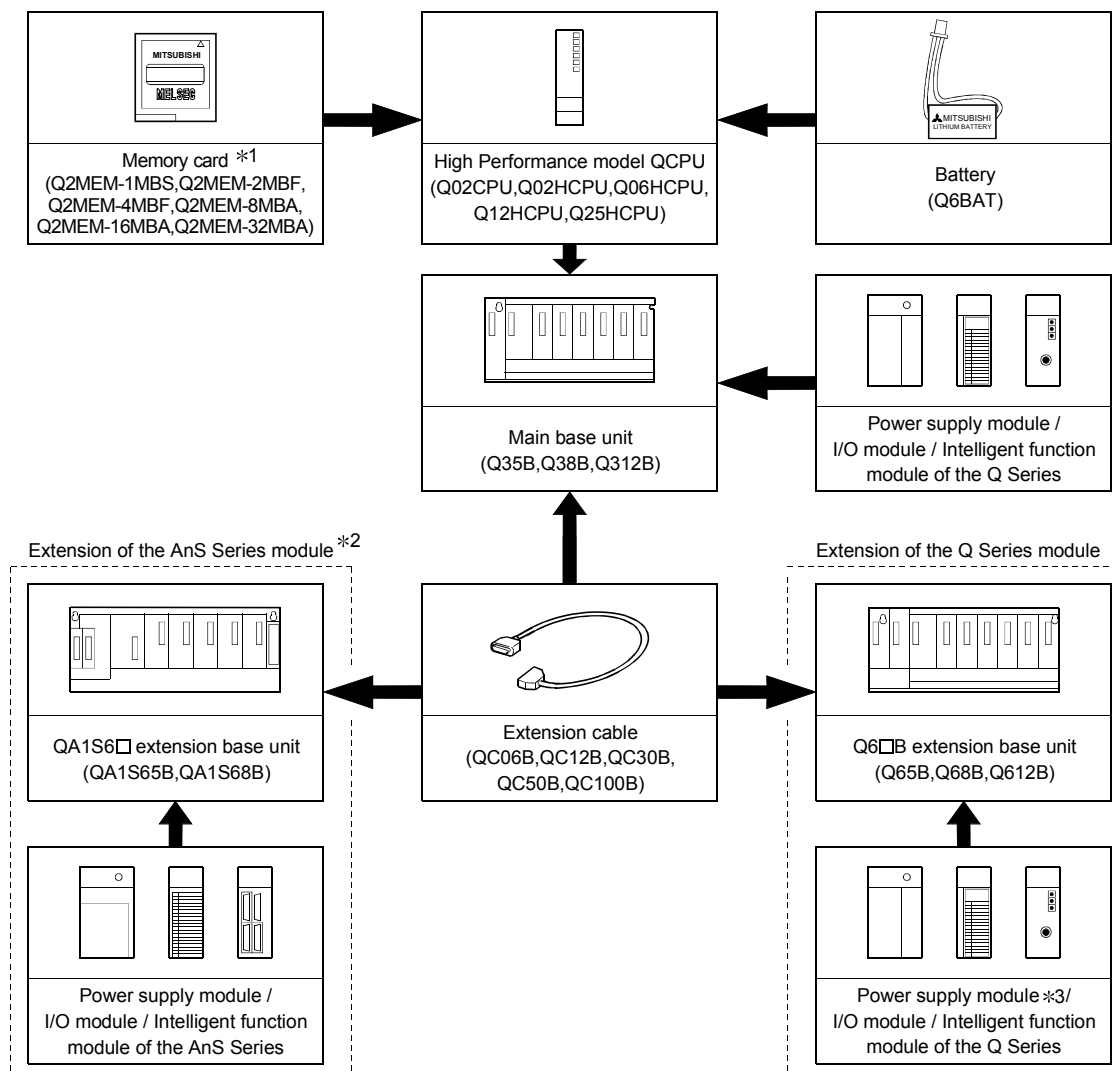
2. SYSTEM CONFIGURATION FOR SINGLE CPU SYSTEM

This section describes the system configuration of the High Performance model QCPU, cautions on use of the system, and configured equipment.

2.1 System Configuration

The outline of the equipment configuration, configuration with peripheral devices, and system configuration in the High Performance model QCPU system is described below.

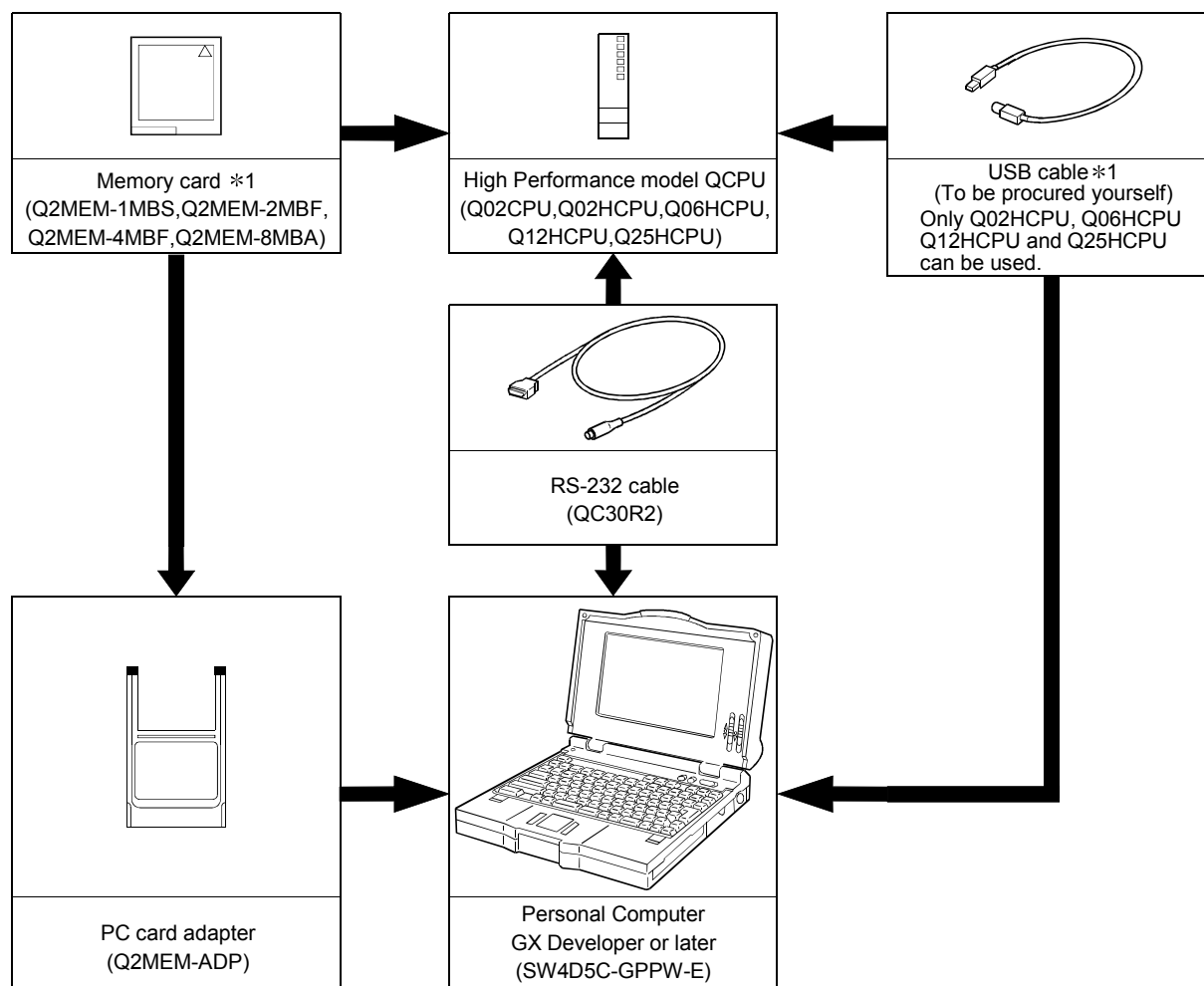
(1) Equipment configuration in High Performance model QCPU system



POINTS

- *1: The number of memory cards to be installed is one sheet.
The memory card must be selected from SRAM, Flash, and ATA according to the application and capacity.
With commercial memory cards, the Operation is not assured.
- *2: QA1S65B and QA1S68B extension base units are used for the power module, I/O module, and special function module of the AnS series.
- *3: The Q series power supply is not required for the Q5□B type extension base unit.

(2) Configuration of peripheral devices for High Performance QCPU



*1: For writing into memory card on GX Developer, and USB cable, refer to the operating manual of the GX Developer.

(3) Outline of system configuration

System configuration	Main base unit(Q312B) Power supply module Slot No. 0 1 2 3 4 5 6 7 8 9 10 11 Extension cable 1st extension stage Power supply module 12 13 14 15 16 17 18 19 20 21 22 23 Extension base unit(Q612B) Power supply module 180 1A0 1C0 1E0 200 220 240 260 280 2A0 2C0 2E0 19F 1BF 1DF 1FF 21F 23F 25F 27F 29F 2BF 2DF 2FF Extension base unit(Q68B) Power supply module 24 25 26 27 28 29 30 31 Extension base unit(Q68B) Power supply module 32 33 34 35 36 37 38 39 Extension base unit(Q65B) Power supply module 40 41 42 43 44 5th extension stage Extension base unit(QA1S68B) Power supply module 45 46 47 48 49 50 51 52 6th extension stage Extension base unit(QA1S68B) Power supply module 53 54 55 56 57 58 59 60 7th extension stage Extension base unit(QA1S65B) Power supply module 61 62 63 When module is installed, an error occurs.
Maximum number of Extension Stages	Seven Extension Stages
Maximum number of I/O modules to be installed	64 modules
Maximum number of I/O points	4096
Main base unit	Q33B, Q35B, Q38B, Q312B
Extension base unit	Q52B, Q55B, Q63B, Q65B, Q68B, Q612B, QA1S65B, QA1S68B
Extension cable	QC05B, QC06B, QC12B, QC30B, QC50B, QC100B
Notes	(1) Extension bases unit of up to seven stages can be used. (2) Do not use extension cable longer than an overall extension length of 13.2m(43.31ft.). (3) When using an extension cable, do not bind it together with the main circuit (high voltage and heavy current) line or do not lay down them closely to each other. (4) When setting the No. of the expansion stages, set it in the ascending order so that the same No. is not set simultaneously by two extension base units. (5) When Q5□B, Q6□B and QA1S6□B types of extension base units are mixed, first connect the Q5□B, Q6□B type and then connect the QA1S6□B type. When setting the No. of the extension stages, set it from Q5□B/Q6□B in order. Although there are no particular restrictions in the order of the installation of the Q5□B and Q6□B, refer to Section 6.6 for usability. (6) Connect the extension cable from OUT of the extension cable connector of the base unit to IN of the extension base unit on the next stage. (7) If 65 or more modules are installed, an error will occur.

2.2 Precaution on System Configuration

This section describes hardware and software packages compatible with QCPU.

(1) Hardware

(a) The number of modules to be installed and functions are limited depending on the type of the modules.

Applicable Module	Type	Limit of number of modules to be installed
Q Series MELSECNET/10H network module	• QJ71PL21 • QJ71BR11 • QJ71LP21-25 • QJ71LP21G • QJ71LP21GE	Up to 4 units
Q series Ethernet interface module	• QJ71E71 • QJ71E71-B2 • QJ71E71-100	Up to 4 units
Q series CC-Link system master local module	• QJ61BT11	No limit
MELSECNET/MINI-S3 data link module	• A1SJ71PT32-S3 • A1SJ71T32-S3	No limit (setting of automatic refresh function not allowed)
AnS series special-function module shown on the right	• A1SD51S • A1SD21-S1 • A1SJ71J92-S3 (When GET/PUT service is used)	Total of 6 units
Interrupt module	• A1SI61 • QI60	One unit only

※: A maximum of 4 modules if the network parameters for CC-Link are set and controlled by the GX Developer. There is no restriction in the number of modules when the parameters are set by the special-purpose instructions for the CC-Link. For details on the CC-Link System Master Local Unit that can set parameters with the special-purpose instructions, refer to the manual for the CC-Link Master Local module.

(b) When the AnS series special-function modules shown below are used, a limitation is given to an accessible device range.

- A1SJ71J92-S3 type JEMANET interface module
- A1SD51S type intelligent communication

Device	Accessible device range
Input (X), Output (Y)	X/Y0 to 7FF
Internal relay (M), Latch relay (L)	M0 to 8191
Link relay (B)	B0 to FFF
Timer (T)	T0 to 2047
Counter (C)	C0 to 1023
Data register (D)	D0 to 6143
Link register (W)	W0 to FFF
Annunciator (F)	F0 to 2047

(c) A graphic operation terminal can be used only for the GOT900 series (Basic OS matching Q mode and communication driver must be installed).

The GOT800 series, A77GOT, and A64GOT cannot be used.

(d) The modules shown below cannot be used.

Module Name	Type
MELSECNET/IO network module	A1SJ71LP21, A1SJ71BR11, A1SJ71QLP21, A1SJ71QLP21S, A1SJ71QLP21GE, A1SJ71QBR11
MELSECNET (II), /B data link module	A1SJ71AP21, A1SJ71AR21, A1SJ71AT21B
Ethernet interface module	A1SJ71QE71-B2-S3(-B5-S3), A1SJ71E71-B2-S3(-B5-S3)
Serial communication module, computer link module	A1SJ71QC24(N), A1SJ71UC24-R2(-R4/-PRF)
CC-Link master-local module	A1SJ61QBT11, A1SJ61BT11
Modem interface module	A1SJ71CMO-S3
ME-NET interface module	A1SJ71ME81

(e) A dedicated instruction for the next module which was present in the QnA/A series program instruction cannot be used for the High Performance model QCPU. Re-writing using FROM/TO instruction is required.

Module Name	Type
High-speed counter module	A1SD61, A1SD62, A1SD62D(-S1), A1SD62E
MELSECNET/MINI-S3	A1SJ71PT32-S3, A1SJ71T32-S3
Positioning module	A1SD75P1-S3(P2-S3/P3-S3), A1SD75M1(M2/M3)
ID module	A1SJ71ID1-R4, A1SJ71ID2-R4

(2) Software package

- (a) Programs for the High Performance Model QCPU can be created using GX Developer Version 4 or later.
- (b) GX Developer Version 6 or later is required to use the functions that have been added in the High Performance Model QCPU products whose first 5 digits of the serial number are "02092."
- (c) GX Developer Version 6 or later is required to use the functions that have been added in the High Performance Model QCPU products whose first 5 digits of the serial number are "03051."

3. GENERAL SPECIFICATIONS

Performance specification of High Performance model QCPU module is as follows:

Item	Specifications					
Operating ambient temperature	0 to 55°C					
Storage ambient temperature	-25 to 75°C *3					
Operating ambient humidity	5 to 95%RH *4, non-condensing					
Storage ambient humidity	5 to 95%RH *4, non-condensing					
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2	Under intermittent vibration	Frequency	Acceleration	Amplitude	10 times each in X, Y, Z directions (for 80 min.)
			10 to 57Hz	—	0.075mm (0.003in.)	
		Under continuous vibration	57 to 150Hz	9.8m/s ²	—	
			10 to 57Hz	—	0.035mm (0.001in.)	
			57 to 150Hz	4.9m/s ²	—	
Shock resistance	Conforming to JIS B 3501, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions X, Y, Z)					
Operating ambience	No corrosive gases					
Operating altitude	2000m (6562ft.) max.					
Installation location	Inside control panel					
Overvoltage category *1	II max.					
Pollution level *2	2 max.					

*1 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities.

The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*2 : This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.

Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

*3 : The storage ambient temperature is -20 to 75°C if the system includes the AnS series modules.

*4 : The operating ambient humidity and storage ambient humidity are 10 to 90%RH if the system includes the AnS series modules.

*5 : Do not use or store the PLC under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause a malfunction.

When using the PLC under pressure, please contact your sales representative.

MEMO

[illegible]

4. HARDWARE SPECIFICATION OF THE CPU MODULE

4.1 Performance Specification

The table below shows the performance specifications of the High Performance model QCPU.

Performance Specifications

Item		Model					Remark	
		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU		
Control method		Repetitive operation of stored program						
I/O control method		Refresh mode					Direct input/output is possible by direct input/output specification (DX□, DY□)	
Programming language (Sequence control dedicated language)		Relay symbol language, logic symbolic language, MELSAP-3 (SFC), MELSAP-L, Function block						
Processing speed (Sequence instruction)	LD X0	0.079μs	0.034μs					
	MOV D0 D1	0.237μs	0.102μs					
Total number of instructions		360 (excluding intelligent function unit dedicated instructions)						
Constant scan (ms) (Function for setting the scan timer to fixed settings)		5 to 2000 (configurable in increments of 0.5 ms)					Set parameter values to specify	
Program *2 capacity	Program memory (Drive 0)	28k Step		60k Step	124k Step	252k Step		
Memory capacity	Memory card (RAM) (Drive 1)	Capacity of loading memory cards(1M max.)					For memory capacity, see Section 7.1.	
	Memory card (ROM) (Drive 2)	Installed memory card capacity (Flash card: 4 Mbyte max., ATA card: 32 Mbyte max.)					For memory capacity, see Section 7.1.	
	Standard RAM (Drive 3)	64kbyte			256kbyte *3			
	Standard ROM (Drive 4)	112 kbyte	240 kbyte	496 kbyte	1008 kbyte			
	CPU shared memory *4	8 kbyte						
Maximum number of stored files	Program memory		28	60	124	252 *1		
	Memory card (RAM)		256					
	Memory card (ROM)	Flash card	288					
		ATA card	512					
	Standard RAM		2					Only one file register and one local device
	Standard ROM		28	60	124	252		

*1:124 is the maximum number of programs that can be executed on High Performance model QCPU.

*2:The maximum number of sequence steps (for one program) for which the parameters are stored in another drive and executed with the High Performance model QCPU can be calculated with the following expression.

(Program size) - (File header size (default: 34 steps))

Refer to the High Performance model QCPU (Q Mode) User's Manual (Function Explanation, Program Fundamentals) for details on the program size and file.

*3:The memory capacity of the products of the Q12HCPU and Q25HCPU earlier than those whose first 5 digits of the serial number are "02091" is 64kbyte. Refer to Section 2.3 for checking your serial number.

*4:This is a memory that has been added in the products whose function version is B.

The CPU shared memory is not latched. The CPU shared memory is cleared when the power is turned on to the PLC or when the High Performance Model QCPU is reset.

Performance Specifications (continued)

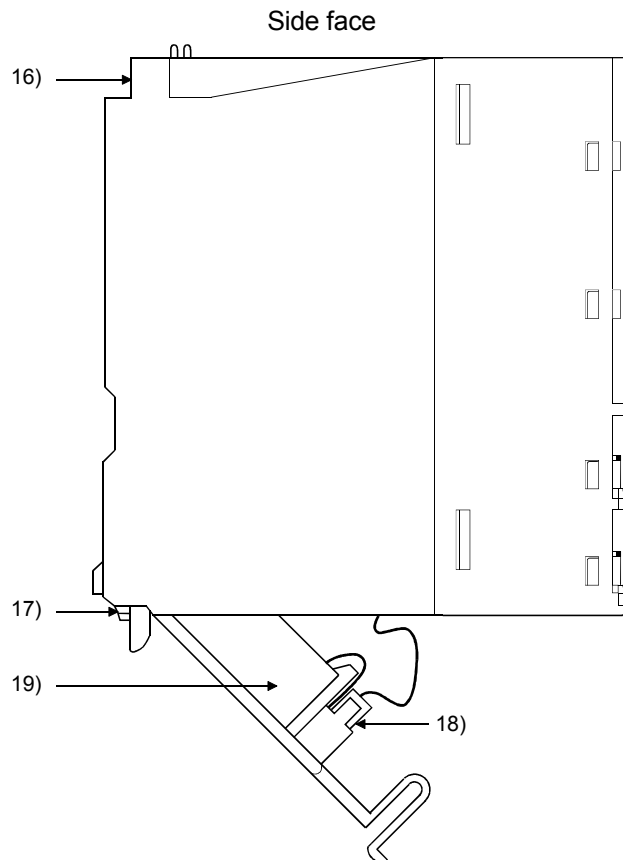
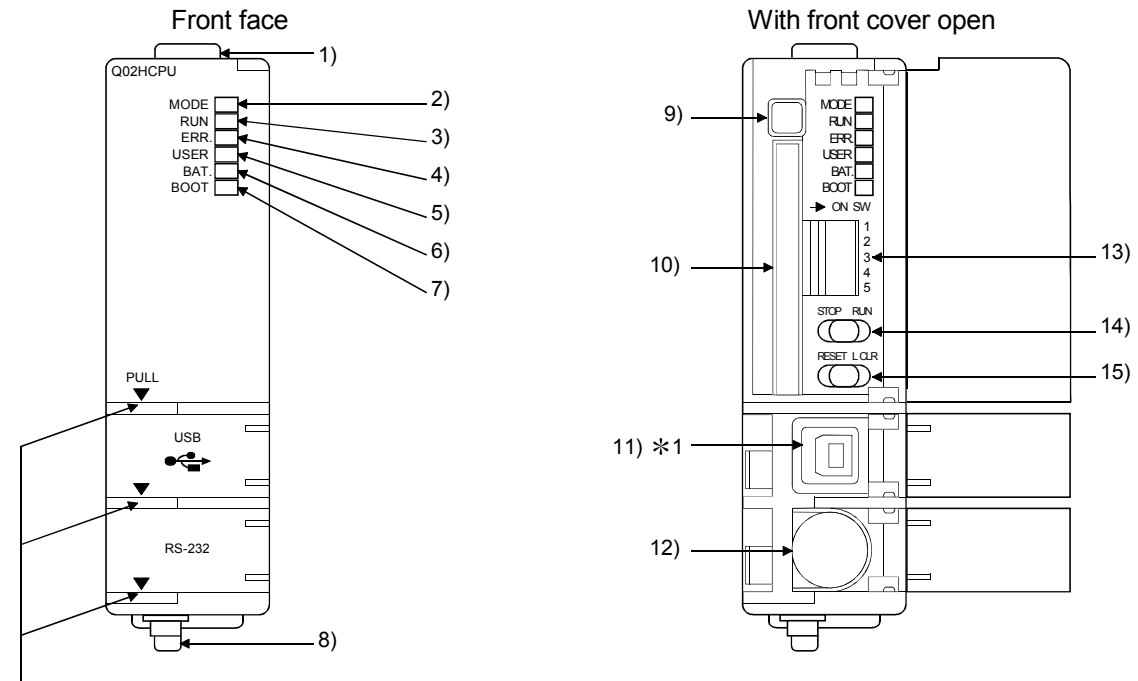
Item		Model					Remark
		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU	
I/O devices points		8192 points (X/Y0 to 1FFF)					Number of devices usable on program
Number of I/O points		4096 points (X/Y0 to FFF)					Number of points accesible to actual input/output modules
Number of device points	Internal relay [M]	Default 8192 points (M0 to 8191)					Number of use points is set with parameters.
	Latch relay [L]	Default 8192 points (L0 to 8191)					
	Link relay [B]	Default 8192points (B0 to 1FFF)					
	Timer [T]	Default 2048 points (T0 to 2047) (for low / high speed timer) Select between low / high speed timer by instructions. The measurement unit of the low / high speed timer is set with parameters. (Low speed timer : 1 to 1000ms, 1ms/unit, default 100ms) (High speed timer : 0.1 to 100ms, 0.1ms/unit, default 10ms)					
	Retentive timer [ST]	Default 0 point(for low / high speed retentive timer) Switchover between the low / high speed retentive timer is set by instructions. The measurement unit of the low speed retentive timer and high speed retentive timer is set with parameters. (Low speed retentive timer : 1 to 1000ms, 1ms/unit, default 100ms) (High speed retentive timer : 0.1 to 100ms, 0.1ms/unit, default 10ms)					
	Counter [C]	• Normal counter default 1024 points (C0 to 1023) • Interrupt counter maximum 256 points (default 0 point, set with parameters)					
	Data register [D]	Default 12288 points (D0 to 12287)					
	Link register [W]	Default 8192 points (W0 to 1FFF)					
	Annunciator [F]	Default 2048 points (F0 to 2047)					
	Edge relay [V]	Default 2048 points (V0 to 2047)					
File Register	[R]	• When a standard RAM is used:32768 points(R0 to 32768) • When a SRAM card is used: The number of points of up to 517120 points can be used by block conversion in increments of 32768 points (R0 to 32767). • When a Flash card (2Mbyte) is used: The number of points of up to 1041408 points can be used by block conversion in increments of 32768 points (R0 to 32767). • When a Flash card (4Mbyte) is used: The number of points of up to 1042432 points can be used by block conversion in increments of 32768 points (R0 to 32767).					When a Flash card is used, read only is possible. The ATA card cannot be used.
	[ZR]	• When a standard RAM is used:(ZR0 to 32767) • When a SRAM card is used: 517120 points (ZR0 to 517119), No block conversion necessary. • When a Flash card (2Mbyte) is used: 1041408 points (ZR0 to 1041407), No block conversion necessary. • When a Flash card (4Mbyte) is used: 1042432 points (ZR0 to 1042431), No block conversion necessary.					

Performance Specifications (continued)

Item		Model					Remark
		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU	
Number of device points	Special link relay [SB]	2048 points (SB0 to 7FF)					The number of device points is fixed.
	Special link register [SW]	2048 points (SW0 to 7FF)					
	Step relay [S]	8192 points (S0 to 8191)					
	Index register [Z]	16 points (Z0 to 15)					
	Pointer [P]	4096 points (P0 to 4095), set parameter values to select usable range of in-file pointer / shared pointers.					
	Interrupt pointer [I]	256 points (I0 to 255) The specified intervals of the system interrupt pointers I28 to I31 can be set with parameters.(0.5 to 1000ms, 0.5 ms/unit) Default I28 : 100ms I29 : 40ms I30 : 20ms I31 : 10ms					
	Special relay [SM]	2048 points (SM0 to 2047)					
	Special register [SD]	2048 points (SD0 to 2047)					
	Function input [FX]	16 points (FX0 to F)					
	Function output [FY]	16 points (FY0 to F)					
	Function register[FD]	5 points (FD0 to 4)					
Link direct device		Device having a direct access to link device. MELSECNET/H use only. Specified form : J□□\X□□, J□□\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□					
Intelligent function unit device		Device having a direct access to the buffer memory of the intelligent function unit. Specified form : U□□G□□					
Latch (power interrupt hold-on) range		L0 to 8191 (default) (Latch range can be set for B, F, V, T, ST, C, D, and W.)					Set parameter values to specify
Remote RUN/PAUSE contact		RUN and PAUSE contacts can be set from among X0 to 1FFF, respectively.					
Clock function		Year, month, day, hour, minute, second, day of the week (leap year automatic distinction) Accuracy -3.18 to +5.25s (TYP. +2.12s) /d at 0°C Accuracy -3.93 to +5.25s(TYP. +1.90s)/d at 25°C Accuracy -14.69 to +3.53s(TYP. -3.67s)/d at 55°C					
Allowable momentary stop time		Varies according to the type of power unit.					
5VDC internal current consumption (A)		0.60	0.64	0.64	0.64	0.64	
Weight [kg]		0.20	0.20	0.20	0.20	0.20	
External dimensions [mm(in.)]		98(H) × 27.4(W) × 89.3(D) (3.86(H) × 1.08(W) × 35.18(D))					

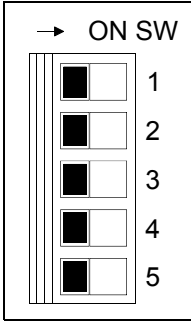
4.2 Part Names and Settings

This section explains the names and settings of the module.



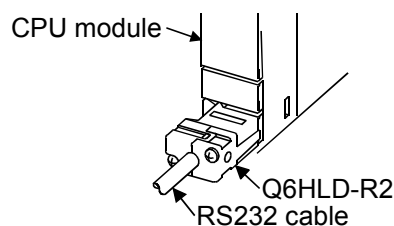
*1: Not provided for Q02CPU.

No.	Name	Application
1)	Module fixing hook	Hook used to fix the module to the base unit. (Single-motion installation)
2)	Mode LED	Indicates the mode of the CPU module. Lit (green) : Q mode Lit (orange) : A mode Flicker (green) : Mandatory ON/OFF of external input/output registered
3)	RUN LED	Indicates the operating status of the CPU module. ON : During operation in "RUN" mode. OFF : During a stop in "STOP" mode or detection of error whose occurrence stops operation. Flicker : When parameter/program is written at STOP and RUN/STOP switch is changed from "STOP" to "RUN". To turn ON the RUN LED after writing the program, carry out the following steps. • Set the RUN/STOP switch from "RUN" → "STOP" → "RUN". • Reset with the RESET/L.CLR switch. • Restart the PLC power. To turn ON the RUN LED after writing the parameters, carry out the following steps. • Reset with the RESET/L.CLR switch. • Restart the PLC power. (If the RUN/STOP switch is set from "RUN" → "STOP" → "RUN" after changing the parameters, the parameters related to the intelligent function module, such as the network parameters, will not be reflected.)
4)	ERR. LED	ON : Detection of self-diagnostic error which will not stop operation, except battery error. (When operation continued at error detection is set in the parameter) OFF : Normal Flicker : Detection of error whose occurrence stops operation. When automatic writing to standard ROM is completed normally. (BOOT LED also flickers.)
5)	USER LED	ON : Error detected by CHK instruction or annunciator ON OFF : Normal Flicker : Execution of latch clear
6)	BAT. ALARM LED	ON : Occurrence of battery error due to reduction in battery voltages of CPU module and memory card. OFF : Normal
7)	BOOT LED	ON : Start of boot operation OFF : Non-execution of boot operation Flicker : When automatic writing to standard ROM is completed normally. (ERR. LED also flickers.)
8)	Module loading lever	Used to load the module to the base unit.

No.	Name	Application															
9)	Memory card EJECT button	Used to eject the memory card from the CPU module.															
10)	Memory card loading connector	Connector used to load the memory card to the CPU module.															
11)	USB connector *1	Connector for connection with USB-compatible peripheral device. (Connector type B) Can be connected by USB-dedicated cable. Not available for Q02CPU.															
12)	RS-232 connector *1	Connector for RS-232 connection Can be connected by RS-232 connection cable (QC30R2).															
13)	DIP switches 	Used to set the items for operation of the CPU module. For system protection and parameter-valid drive functions, refer to the High Performance model QCPU (Q mode) User's Manual (Function Explanation, Program Fundamentals). SW1 : Used to set system protection. Batch-inhibits write and control directives to the CPU module. (Shipped in OFF position) OFF : No protection ON : Protection SW2, SW3: Used to specify parameter-valid drive. (Both SW2 and SW3 are shipped in OFF position) <table border="1"> <thead> <tr> <th>SW2</th><th>SW3</th><th>Parameter Drive</th></tr> </thead> <tbody> <tr> <td>OFF</td><td>OFF</td><td>Program memory (Drive 0)</td></tr> <tr> <td>ON</td><td>OFF</td><td>SRAM card (Drive 1)</td></tr> <tr> <td>OFF</td><td>ON</td><td>Flash card/ATA card (Drive 2)</td></tr> <tr> <td>ON</td><td>ON</td><td>Standard ROM (Drive 4)</td></tr> </tbody> </table> Note: Parameters cannot be stored in standard RAM (Drive 3). SW4 : Must not be used. Normally OFF. (Shipped in OFF position) SW5 : Must not be used. Normally OFF. (Shipped in OFF position)	SW2	SW3	Parameter Drive	OFF	OFF	Program memory (Drive 0)	ON	OFF	SRAM card (Drive 1)	OFF	ON	Flash card/ATA card (Drive 2)	ON	ON	Standard ROM (Drive 4)
SW2	SW3	Parameter Drive															
OFF	OFF	Program memory (Drive 0)															
ON	OFF	SRAM card (Drive 1)															
OFF	ON	Flash card/ATA card (Drive 2)															
ON	ON	Standard ROM (Drive 4)															
14)	RUN/STOP switch	RUN : Executes sequence program operation. STOP : Stops sequence program operation.															
15)	RESET/L.CLR switch	RESET : Used to perform hardware reset, operation fault rest, operation initialization, etc. If this switch is left in the RESET position, the whole system will be reset and the system will not operate properly. After performing reset, always return this switch to the neutral position. L.CLR : Used to turn "OFF" or "zero" all data in the parameter-set latch area. Used to clear the sampling trace and status latch registration.															
16)	Module fixing screw hole	Hole for the screw used to fix to the base unit. (M3 × 12 screw)															
17)	Module fixing hook	Hook used to fix to the base unit.															
18)	Battery connector pin	For connection of battery lead wires. (When shipped from the factory, the lead wires are disconnected from the connector to prevent the battery from consuming.)															
19)	Battery	Backup battery for use of program memory, standard RAM and power failure compensation function.															

*1 : When normally connecting a cable to the USB connector or RS-232 connector, clamp the cable to prevent it from coming off due to the dangling, moving or carelessly pulling of the cable.

Q6HLD-R2 type RS-232 Connector Disconnection Prevention Holder is available as a clamp for RS-232 connector.



4.3 Switch Operation After Writing in Program

When writing a program into the CPU module, do not turn off the system protect set switch SW1 in advance (When the switch is turned off, the system will not be protected).

(1) When a program is written while CPU module is stopped:

When a program is written while the CPU module is stopped, operate the switch in the order shown below.

1) RUN / STOP switch : STOP

RUN LED: Goes off. CPU module in stop status → Write a program.

2) RESET / L.CLR switch : Tilt this switch to RESET once, and return it to the original center position.

3) RUN / STOP switch : STOP → RUN

RUN LED: Lights up. CPU module in running status

(2) When a program is written while CPU module is running.

When a program is written while the CPU module is running, the switch need not be operated.

POINTS
(1) Even if the RUN/STOP switch is set to RUN immediately after a program is written when the CPU module is in the stop status, CPU module will not come into RUN status. When the CPU module is reset with the RESET / L.CLR switch and the RUN/STOP switch is set to RUN after a program has been written, the CPU module can be brought into RUN status. (2) If the CPU module is desired to be brought into RUN status without resetting it, operate the RUN/STOP switch from STOP to RUN, RUN to STOP, and STOP to RUN in that order. After the seconds STOP to RUN switch operation, the CPU module is brought into RUN status. (3) When a program is written while the CPU module is running in boot operation, the program written during the running is written into the program memory. After a program has been written while the CPU module is running, write the program also into the boot original memory. Failure to write a program into the boot original memory will run an old program at the time of the next boot operation. (For details of the boot operation, see High Performance model QCPU(Q mode) User's Manual (Function Explanation, Program Fundamentals)).

4.4 Latch Clear Operation

To perform latch clear, operate the RESET/L.CLR switch in the following procedure.

- 1) RUN/STOP switch : STOP
- 2) RESET/L.CLR switch : Move the switch to L.CLR several times until the USER LED flickers.
USER LED: Flicker Ready for latch clear.
- 3) RESET/L.CLR switch : Move the switch to L.CLR once more.
USER LED: OFF Latch clear complete.

POINTS

- (1) The ineffective range for latch clear can be set for each device by the device setting parameter.
- (2) In addition to the way of using the RESET/L.CLR switch for latch clear, remote latch clear may be performed from GX Developer.
Refer to the QCPU (Q mode) User's Manual (Function Explanation, Program Fundamentals).

4.5 Executing automatic write to standard ROM.

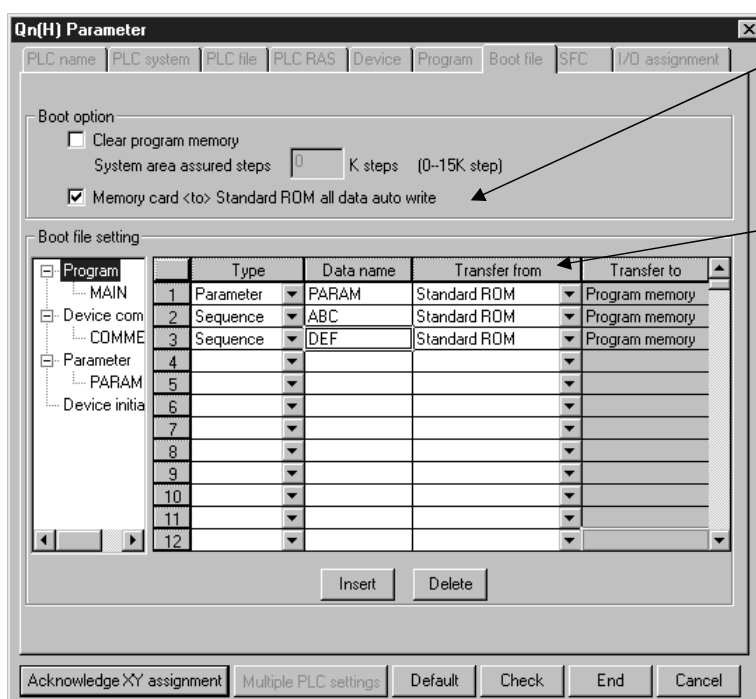
(1) Order of execution for automatic writing to the standard ROM

Automatic writing to the standard ROM is carried out with the following procedures.

(a) Operation with GX Developer (setting automatic write to standard ROM)

- 1) Check the "Memory card <to> Standard ROM all data write" item in the PLC parameter boot file setting.

This sets the parameters and programs to be booted with the boot file.
(Sets the place of transmission in the "Standard ROM" settings.)



Check "Memory card <to> Standard ROM all data auto write".

Set the transfer source to "Standard ROM".

- 2) Store the set parameters and programs to be booted in the memory card.

- (b) Operations with CPU module (automatic writing in the standard ROM)
 - 1) Switch of the power supply to the PLC.
 - 2) Mount the memory card that contains the parameters and programs to be booted onto the CPU module.
 - 3) Set the parameter's valid drive in the mounted memory card with the CPU's dip switches.
 - When a SRAM card is mounted: SW2 : ON, SW3 : OFF
 - When a Flash/ATA card is mounted: SW2 : OFF, SW3 : ON
 - 4) Switch on the power supply to the PLC.
 - 5) "BOOT LED" will flash when automatic writing in the standard ROM has been completed, and the CPU module will assume a suspension error status.
 - 6) Switch off the power supply to the PLC.
 - 7) Remove the memory card, and then set the parameter's valid drive in the standard ROM with the CPU's dip switches.
 - Standard ROM: SW2 : ON, SW3 : ON
- (c) The parameters and programs will be booted from the standard ROM to the program memory when the PLC is switched on to enable actual operations.

5. POWER SUPPLY MODULE

5.1 Specification

5.1.1 Power supply module specifications

This section gives the specifications of the power supply modules.

Item		Performance Specifications			
		Q61P-A1	Q61P-A2	Q62P	Q63P
Base loading position		Power supply module loading slot			
Applicable base unit		Q3□B, Q6□B			
Input power supply		100 to 120VAC ^{+10%} -15% (85 to 132VAC)	200 to 240VAC ^{+10%} -15% (170 to 264VAC)	100 to 240VAC ^{+10%} -15% (85 to 264VAC)	24VDC ^{+30%} -35% (15.6 to 31.2VDC)
Input frequency		50/60Hz ±5%			—
Input voltage distortion factor		Within 5% (See, section 5.1.3)			—
Max. input apparent power		105VA			45W
Inrush current		20A within 8ms			100A within 1ms
Rated output current	5VDC	6A		3A	6A
	24VDC	—		0.6A	—
External output voltage		—		24VDC ±10%	—
Overcurrent protection * 1	5VDC	6.6A or more		3.3A or more	6.6A or more
	24VDC	—		0.66A or more	—
Overvoltage protection * 2	5VDC	5.5 to 6.5V			
	24VDC	—			
Efficiency		70% or more		65% or more	70% or more
Permissible instantaneous power failure time * 3		Within 20ms			Within 10ms (at 24VDC input)
Dielectric withstand voltage		Across inputs/LG and outputs/FG 2,830VAC rms/3 cycles (2000 m (6562 ft.))			500VAC across primary and 5VDC
Insulation resistance		Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10M Ω or more by insulation resistance tester			10M Ω or more by insulation resistance tester
Noise immunity		• By noise simulator of 1,500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV			By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
Operation indication		LED indication (lit at 5VDC output)			
Fuse		Built-in (Unchangeable by user)			
Contact output section	Application	ERR contact (contact switched off (opened: normally closed contact) at an error stop of CPU module), for CPU module operating status output			
	Rated switching voltage/current	24VDC, 0.5A			
	Minimum switching load	5VDC, 1mA			
Contact output section	Response time	OFF to ON: 10ms max. ON to OFF: 12ms max.			
	Life	Mechanical : More than 2 million times Electrical : More than 100 thousand times at rated switching voltage/current			
	Surge suppressor	No			
	Fuse	No			
Terminal screw size		M3.5 × 7			
Applicable wire size		0.75 to 2mm ²			
Applicable crimping terminal		RAV1.25 to 3.5, RAV2 to 3.5			
Applicable tightening torque		59 to 78N•cm			
External dimensions		98mm (H) × 59.2mm (W) × 90mm (D) (3.86in. × 2.33in. × 3.55in.)			
Weight		0.31kg		0.39kg	0.33kg

Power Supply Module Specifications (Continued)

Item		Performance Specifications		
		A1S61PN	A1S62PN	A1S63P
Base loading position		Power supply module loading slot		
Applicable base unit		QA1S65B, QA1S68B		
Input power supply		100 to 240VAC $\begin{matrix} +10\% \\ -15\% \end{matrix}$ (85 to 264VAC)		24VDC $\begin{matrix} +30\% \\ -35\% \end{matrix}$ (15.6 to 31.2VDC)
Input frequency		50/60Hz $\pm 5\%$		—
Input voltage distortion factor		Within 5%		
Max. input apparent power		105VA		41W
Inrush current		20A within 8ms		81A within 1ms
Rated output current	5VDC	5A	3A	5A
	24VDC	—	0.6A	—
Overcurrent protection * 1	5VDC	5.5A or more	3.3A or more	5.5A or more
	24VDC	—	0.66A or more	—
Overvoltage protection * 2	5VDC	5.5 to 6.5V		
	24VDC	—		
Efficiency		65% or more		
Permissible instantaneous power failure time * 3		Within 20ms		Within 10ms (at 24VDC input)
Dielectric withstand voltage		Across inputs/LG and outputs/FG 2,830VAC rms/3 cycles (2000 m (6562 ft.))		500VAC across primary and 5VDC
Insulation resistance		Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10M Ω or more by insulation resistance tester		5M Ω or more by insulation resistance tester
Noise immunity		- By noise simulator of 1,500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency - Noise voltage IEC61000-4-4, 2kV		By noise simulator of 500Vp-p noise voltage, 1 μ s noise width and 25 to 60Hz noise frequency
Operation indication		LED indication (lit at 5VDC output)		
Fuse		Built-in (Unchangeable by user)		
Contact output section	Application	—		
	Rated switching voltage/current	—		
	Minimum switching load	—		
Contact output section	Response time	—		
	Life	—		
	Surge suppressor	—		
	Fuse	—		
Terminal screw size		M3.5 $\times$ 7		
Applicable wire size		0.75 to 2mm ²		
Applicable crimping terminal		RAV1.25 to 3.5, RAV2 to 3.5		
Applicable tightening torque		59 to 78N $\cdot$ cm		
External dimensions [mm (in.)]		130(H) $\times$ 55(W) $\times$ 93.6(D) (5.12 $\times$ 2.17 $\times$ 3.69)		
Weight (kg)		0.60		0.50

POINTS

*1 : Overcurrent protection

The overcurrent protection device shuts off the 5 V, 24 VDC circuit and stops the system if the current flowing in the circuit exceeds the specified value. When this device is activated, the power supply module LED is switched OFF or dimly lit. If this happens, eliminate the cause of the overcurrent and start up the system again.

*2 : Overvoltage protection

The overvoltage protection device shuts off the 5 VDC circuit and stops the system if a voltage of 5.5 to 6.5 V is applied to the circuit. When this device is activated, the power supply module LED is switched OFF. If this happens, switch the input power OFF, then ON to restart the system. The power supply module must be changed if the system is not booted and the LED remains OFF.

*3 : Permissible instantaneous power failure time

(1) For AC input power supply

- An instantaneous power failure lasting less than 20ms will cause AC down to be detected, but operation will continue.
- An instantaneous power failure lasting more than 20ms may cause the operation to continue or initial start to take place depending on the power supply load.

Furthermore, by using the same AC power supply for the AC input module and the power supply module, it is possible to prevent the sensor, to which the AC input module is connected, from turning OFF when it is ON when the power is turned OFF.

However, if only the AC input module is connected to the AC line, which is connected to the power supply, detection of the AC down for the power supply module may be delayed by the capacitor in the AC input module. Thus, connect a load of approx. 30mA per QX10 unit to the AC line.

(2) For DC input power supply

- An instantaneous power failure lasting less than 10ms (*1) will cause 24VDC down to be detected, but operation will continue.
- An instantaneous power failure lasting more than 10ms (*1) may cause the operation to continue or initial start to take place depending on the power supply load.

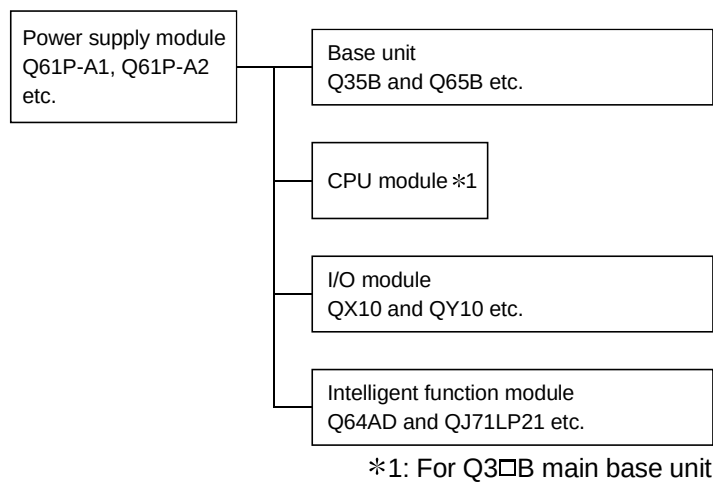
(*1: This is for a 24VDC input. This is 10ms or less for 24VDC or less.)

5.1.2 Selecting the power supply module

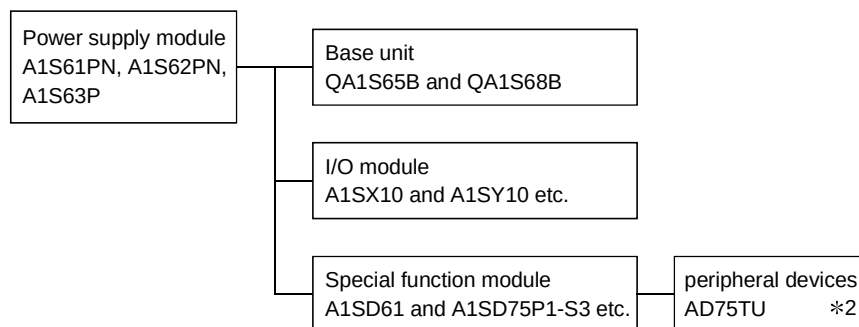
The power supply module is selected according to the total of current consumption of the base units, input/output modules, intelligent function module, special function module, and peripheral devices supplied by its power module. For the internal current consumption of 5 VDC of the base unit, see the Base Unit Chapter of this manual.

For the internal current consumption of 5 VDC of the I/O output modules, intelligent function module, special function module, and peripheral devices, see the User's Manuals of their respective modules.

(1) When the base unit is of Q3□B or Q6□B:



(2) When the base unit is of QA1S6□B:



*2: Select the power module also in consideration of the current consumption of the peripheral devices connected to the special function module.

For example, when the AD75TU is connected to the A1SD75P1-S3, the current consumption of the AD75TU must also be taken into account.

5.1.3 Precaution when connecting the uninterruptive power supply

Be sure of the following terms when connecting the High Performance model QCPU system to the uninterruptive power supply (abbreviated as UPS hereafter):

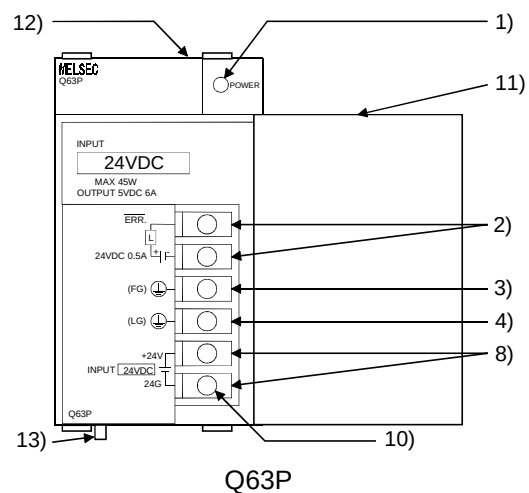
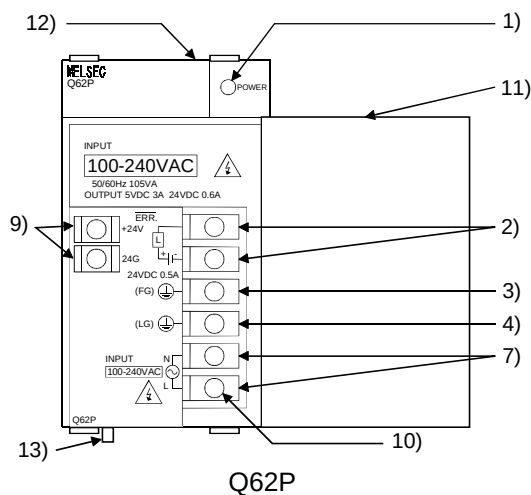
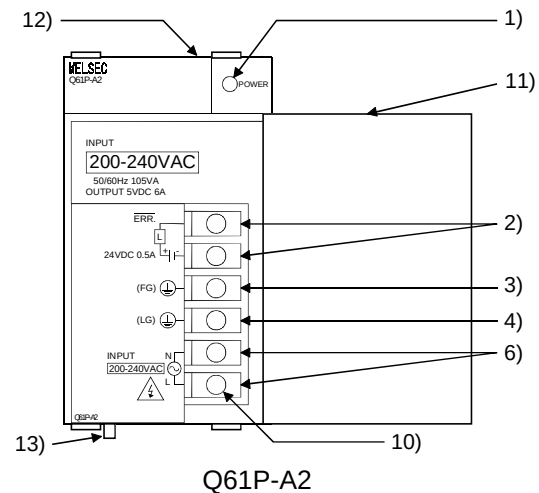
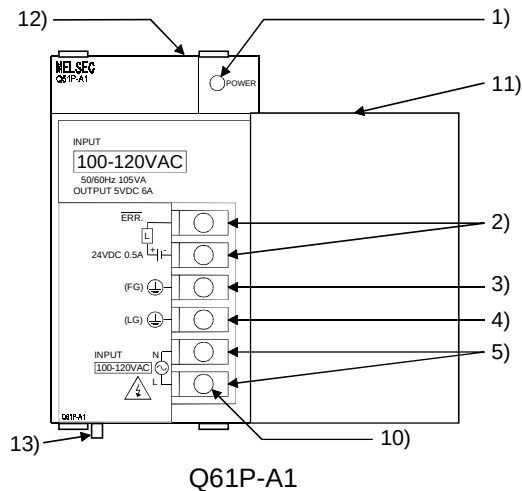
Use a UPS which employs the constant inverter power supply method with 5 % or less voltage fluctuation.

Do not use a UPS with the constant commercial power supply method.

5.2 Names of Parts and Settings

The names of the parts of each power module are described below.

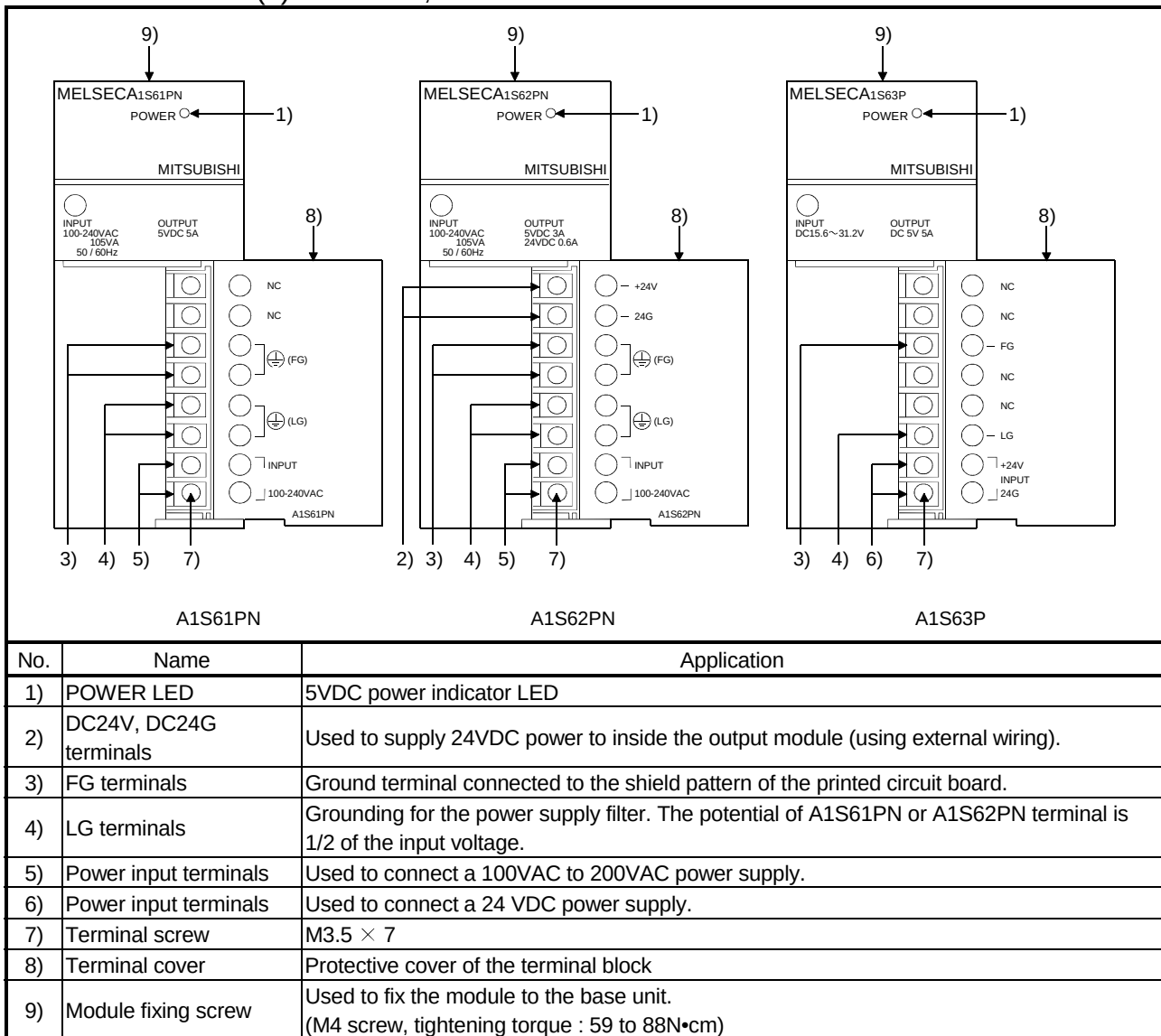
(1) Q61P-A1, Q61P-A2, Q62P, Q63P



No.	Name	Application
1)	POWER LED	5VDC power indicator LED
2)	ERR terminals	Turned OFF (opened) when a stop error occurs in the CPU module. Normally off when loaded in an extension base unit.
3)	FG terminal	Ground terminal connected to the shield pattern of the printed circuit board.
4)	LG terminal	Grounding for the power supply filter. The potential of Q61P-A1, Q61P-A2 and Q62P terminal is 1/2 of the input voltage
5)	Power input terminals	Used to connect a 100VAC power supply.
6)	Power input terminals	Used to connect a 200VAC power supply.
7)	Power input terminals	Used to connect a 100VAC to 200VAC power supply.
8)	Power input terminals	Used to connect a 24VAC power supply.
9)	24V DC, 24G DC terminals	Used to supply 24VDC power to inside the output module (using external wiring).
10)	Terminal screw	M3.5 × 7
11)	Terminal cover	Protective cover of the terminal block
12)	Module fixing screw	Used to fix the module to the base unit. M3 × 12 screw (user-prepared) (Tightening torque : 36 to 48N•cm)
13)	Module loading lever	Used to load the module into the base unit.

POINTS		
(1) The Q61P-A1 is dedicated for inputting a voltage of 100 VAC. Do not input a voltage of 200 VAC into it or trouble may occur on the Q61P-A1.		
Power module type	Supply power voltage	
	100VAC	200VAC
Q61P-A1	Operates normally.	Power supply module causes trouble.
Q61P-A2	Power supply module does not cause trouble. CPU module cannot be operated.	Operates normally.
(2) Ensure that the earth terminals LG and FG are grounded.		

(2) A1S61PN, A1S62PN and A1S63P



POINTS

- (1) Do not wire to those terminals for which NC is stamped on the terminal block.
- (2) Ensure that the earth terminals LG and FG are grounded.

6. BASE UNIT AND EXTENSION CABLE

This section describes the specifications of the extension cables for the base units (main base unit and extension base unit) used in the system and the specification standards of the extension base unit.

6.1 Base Unit Specification Table

(1) Main base unit specifications

Type	Q33B	Q35B	Q38B	Q312B
Item				
Number of I/O modules installed	3	5	8	12
Possibility of extension	Extendable			
Applicable module	Q series modules			
5 VDC internal current consumption (A)	0.105	0.110	0.114	0.121
Mounting hole size	M4 screw hole or $\phi 4.5$ hole (for M4 screw)			
External dimensions[mm(in.)]	189(W) $\times$ 98(H) $\times$ 44.1(D) (7.43(W) $\times$ 3.86(H) $\times$ 17.4(D))	245(W) $\times$ 98(H) $\times$ 44.1(D) (9.65(W) $\times$ 3.86(H) $\times$ 17.4(D))	328(W) $\times$ 98(H) $\times$ 44.1(D) (12.92(W) $\times$ 3.86(H) $\times$ 17.4(D))	439(W) $\times$ 98(H) $\times$ 44.1(D) (17.30(W) $\times$ 3.86(H) $\times$ 17.4(D))
Weight [kg]	0.23	0.25	0.35	0.45
Attachment	Mounting screw M4 $\times$ 14 4 pieces (DIN rail mounting adapter to be sold separately)			
DIN rail mounting Adapter type	Q6DIN3	Q6DIN2	Q6DIN1	

(2) Extension base unit specification (Type not requiring power supply module)

Type	Q52B	Q55B
Item		
Number of I/O modules installed	2	5
Possibility of extension	Extendable	
Applicable module	Q series modules	
5 VDC internal current consumption	0.080A	0.100A
Mounting hole size	M4 screw hole or $\phi 4.5$ hole (for M4 screw)	
External dimensions	W	106 (4.17) mm (in.)
	H	98 (3.86) mm (in.)
	D	44.1 (1.74) mm (in.)
Weight	0.14kg	0.23kg
Attachment	Mounting screw M4 $\times$ 14 4 pieces (DIN rail mounting adapter to be sold separately)	
DIN rail mounting Adapter type	Q6DIN3	

(3) Extension base unit specifications

Type Item	Q63B	Q65B	Q68B	Q612B	QA1S65B	QA1S68B
Number of I/O modules installed	3	5	8	12	5	8
Possibility of extension	Extendable					
Applicable module	Q series modules				AnS series modules	
5 VDC internal current consumption (A)	0.105	0.110	0.114	0.121	0.117	0.118
Mounting hole size	M4 screw hole or $\phi 4.5$ hole (for M4 screw)				M5 screw hole or $\phi 5.5$ hole (for M5 screw)	
External dimensions[mm(in.)]	189(W)×98(H) ×44.1(D) (7.43(W)×3.86 (H)×17.4(D))	245(W)×98(H) ×44.1(D) (9.65(W)×3.86 (H)×17.4(D))	328(W)×98(H) ×44.1(D) (12.92(W)×3.86 (H)×17.4(D))	439(W)×98(H) ×44.1(D) (17.30(W)×3.86 (H)×17.4(D))	315(W)×130(H) ×51.2(D) (12.41(W)×5.12 (H)×2.02(D))	420(W)×130(H) ×51.2(D) (16.55(W)×5.12 (H)×2.02(D))
Weight [kg]	0.23	0.25	0.35	0.45	0.75	1.00
Attachment	Mounting screw M4×14 4 pieces (DIN rail mounting adapter sold separately)				Mounting screw M5×25 4 pieces	
DIN rail mounting Adapter type	Q6DIN3	Q6DIN2	Q6DIN1		—	—

6.2 Extension Cable Specification Table

The list below shows the specifications of the extension cables which can be used for the QCPU system.

Type Item	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Cable length [m(ft.)]	0.45(1.48)	0.6(1.97)	1.2(3.93)	3.0(9.84)	5.0(16.39)	10.0(32.79)
Application	Connection across the main base unit and extension base unit or across the extension base units.					
Weight [kg]	0.15	0.16	0.22	0.40	0.60	1.11

POINT

When the extension cables are used in combination, limit the overall distance of the combined cable to 13.2 m(43.28 ft.).

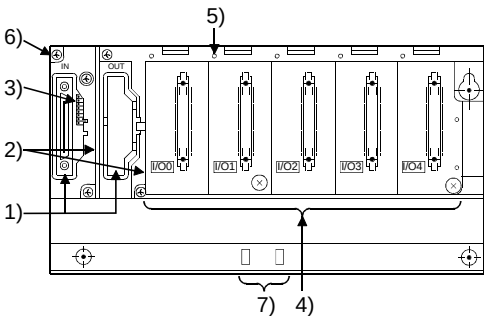
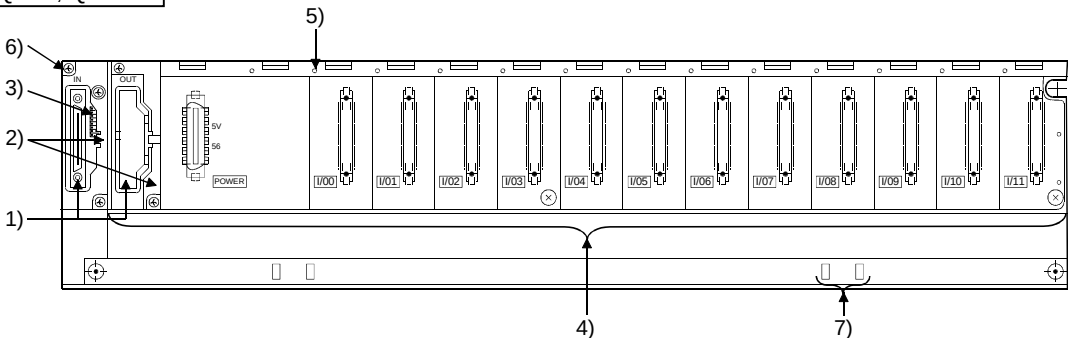
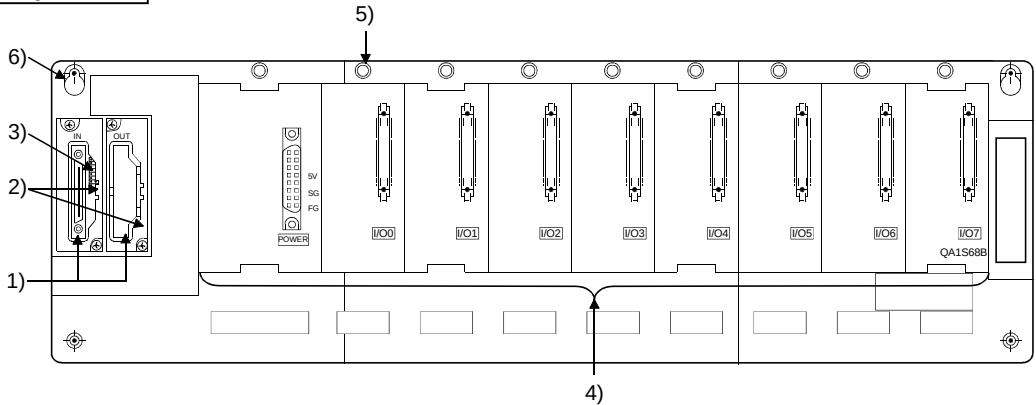
6.3 The Names of The Parts of The Base Unit

The names of the parts of the base unit are described below.

(1) Main base unit(Q33B, Q35B, Q38B, Q312B)

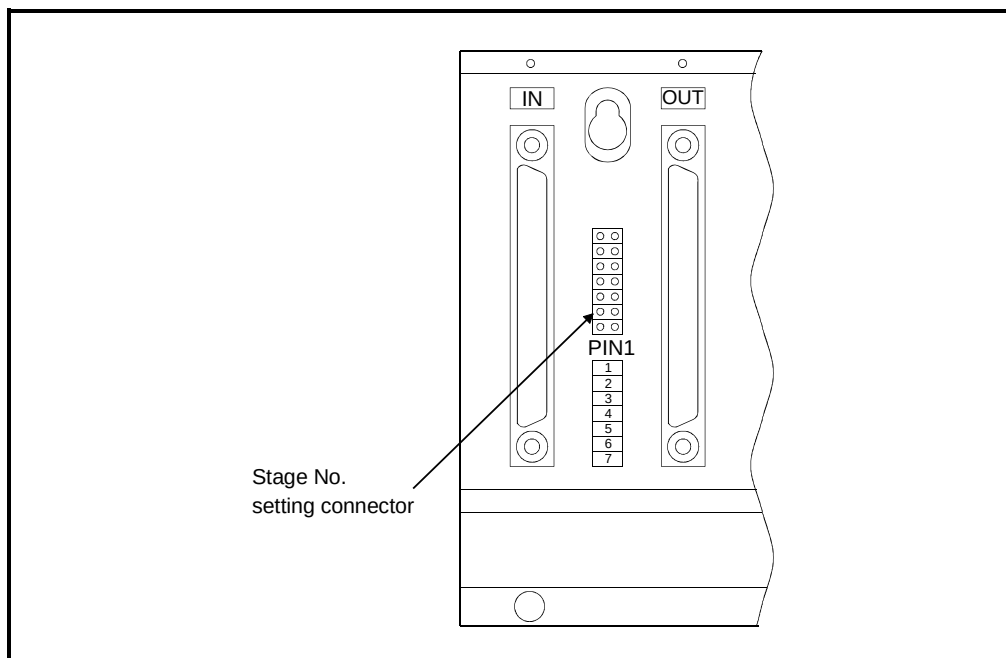
No.	Name	Application
1)	Extension cable connector	Connector for sending and receiving signals from the extension base unit, to which the extension cables are connected.
2)	Base cover	Protective cover of extension cable connector. Before an extension cable is connected, the area of the base cover surrounded by the groove under the word "OUT" on the base cover must be removed with a tool such as nippers.
3)	Module connector	Connector for installing the power supply module, CPU module, input/output modules, and intelligent function module. To the connectors located in the spare space where these modules are not installed, attach the supplied connector cover or the blank cover module QG60 to prevent entry of dirt.
4)	Module fixing screw hole	Screw hole for fixing the module to the base. Screw size:M3 × 12
5)	Base mounting hole	Hole for mounting this base unit onto the panel of the control panel (for M4 screw)
6)	DIN rail adapter mounting hole	Hole for mounting DIN rail adapter

(2) Extension base unit (Q5 □ B, Q6 □ B, QA1S6 □ B)

Q52B, Q55B		
		
Q65B, Q68B, Q612B		
		
QA1S65B, QA1S68B		
		
No.	Name	Application
1)	Extension cable connector	Connectors for sending and receiving signals from the main base unit or the other extension base units, to which the extension cables are connected. Do not remove the supplied connector cover.
2)	Base cover	Protective cover of extension cable connector.
3)	No. of stages setting switch	Switch for setting the number of stages of the extension base. For setting method, see Section 6.4.
4)	Module connector	Connectors for installing the power supply module, input/output modules, and intelligent function module/ special function module. To those connectors located in the spare space where these modules are not installed, apply the supplied connector cover or the blank cover module to prevent entry of dirt. Blank cover module applicable to Q52B, Q55B, Q65B, Q68B and Q612B :QG60 Blank cover module applicable to QA1S65B and QA1S68B :A1SG60
5)	Module fixing screw hole	Screw hole for fixing the module to the base. Q52B, Q55B, Q65B, Q68B and Q612B Screw size: M3 × 12 QA1S65B and QA1S68B Screw size: M4 × 12
6)	Base mounting hole	Hole for mounting this base unit on the panel of the control panel. Q52B, Q55B, Q65B, Q68B and Q612B For M4 screw QA1S65B and QA1S68B For M5 screw
7)	DIN rail hook	DIN rail adapter mounting hole.

6.4 Setting the Extension Base Unit

The number of stages setting method of each extension base unit to be used when extension base units are installed is described below.



Setting of Stage Number for Extension Base Units

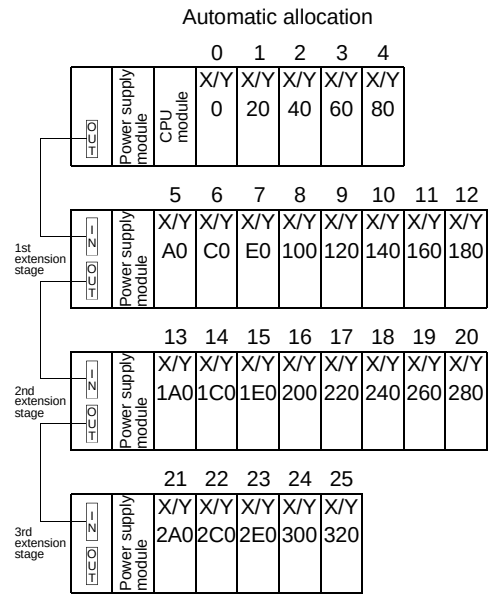
	Number Setting for Extension Stages						
	1st stage	2nd stage	3rd stage	4th stage	5th stage	6th stage	7th stage
Setting of stage number setting connector							

POINTS

- (1) To set the stages No. setting connector, set a number from 1 to 7 according to the number of extension stages.
Do not set the same stage number at two or more positions or do not fail to set a number. A miss-input or miss-output may occur.
- (2) When Q5□B/Q6□B and QA1S6□B are mixed on the extension stage, set the stages No. in order starting from Q5□B/Q6□B.
Example: When four units of Q68B and three units of QA1S68B totaling seven units are extended, set the stages No. from 1 to 4 on the Q68B, and then set the stages No. from 5 to 7 on the QA1S68B.
To connect the extension base, first connect the Q6□B and then connect the QA1S6□B.

6.5 Input/output Number Allocation

The input/output numbers can be automatically allocated according to the positions of installation.



* In this system, 32-point modules are loaded on slots 0 to 25.

For I/O allocation set method, see the Operating Manual of the GX Developer.

For details of input number allocation, refer to the following manual.

- High Performance Model QCPU (Q mode) User's Manual (Function Explanation, Program Fundamentals)

POINT

For the extension using the Q5□B, Q6B□B and QA1S6□B, allocate the I/O numbers on the modules starting from the Q series module installed on the Q5□B, Q6□B base unit.

<Example> Where 32 modules are installed in all slots with the configuration shown below.

Q38B main base unit	00 to FF
Q5□B, Q68B extension base unit	100 to 1FF
QA1S68B extension base unit	200 to 2FF
QA1S68B extension base unit	300 to 3FF

6.6 Guideline for Use of Extension Base Units (Q5□B)

Since the Q5□B is supplied with 5VDC from the power supply module on the main base unit, a voltage drop occurs at extension cables.

Improper input/output may be provided if the specified voltage (4.75VDC or higher) is not supplied to the "IN" connector of the Q5□B.

When using the Q5□B, make sure that the "IN" connector of the Q5□B is supplied with 4.75VDC or higher.

And it is recommend to connect it with the shortest possible extension cable right after connecting the main base unit, so as to minimize the effects of voltage drop.

(1) When only the Q5□B is connected to the extension base

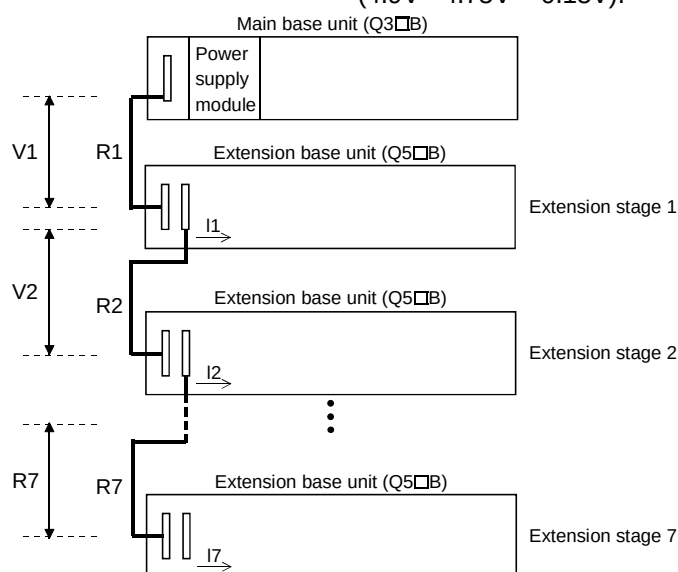
(a) Selection condition

4.75VDC or higher should be supplied to the "IN" connector of the Q5□B in the final extension stage.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.

Therefore, the Q5□B can be used if the voltage drop is 0.15V or lower ($4.9V - 4.75V = 0.15V$).



Extension Cable Type	Extension Cable Conductor Resistance (Ω)
QC05B	0.044
QC06B	0.051
QC12B	0.082
QC30B	0.172
QC50B	0.273
QC100B	0.530

Symbol	Description
V1	Voltage drop at the extension cable between the main base unit and extension base unit
Vn	Voltage drop at the extension cable between the extension base unit (extension stage n-1) and extension base unit (extension stage n)
R1	Cable resistance between the main base unit and extension base unit
Rn	Cable resistance between the extension base unit (extension stage n-1) and extension base unit (extension stage n)
I1 to I7	5VDC current consumption among extension stage 1 to 7 *1

*1: Sum total of current consumed by Q5□B and currents consumed by the input/output, intelligent function modules loaded on the Q5□B.

The symbols including "I" (I1 to I7) vary with the modules loaded on the extension base unit. For details of the symbol, refer to the user's manuals of the module used.

List for Calculating Voltage Drops Occurring at Extension Cables in System Consisting of Extensions 1 to 7

Q5□B Loading Position	Voltage Drop at Extension Cable on Corresponding Extension Unit							Sum Total of Voltage Drops to "IN" Connector of Q5□B (V)
	V1	V2	V3	V4	V5	V6	V7	
Extension stage 1	$R1 \cdot I1$	—	—	—	—	—	—	$V=V1$
Extension stage 2	$R1(I1+I2)$	$R2 \cdot I2$	—	—	—	—	—	$V=V1+V2$
Extension stage 3	$R1(I1+I2+I3)$	$R2(I2+I3)$	$R3 \cdot I3$	—	—	—	—	$V=V1+V2+V3$
Extension stage 4	$R1(I1+I2+I3+I4)$	$R2(I2+I3+I4)$	$R3(I3+I4)$	$R4 \cdot I4$	—	—	—	$V=V1+V2+V3+V4$
Extension stage 5	$R1(I1+I2+I3+I4+I5)$	$R2(I2+I3+I4+I5)$	$R3(I3+I4+I5)$	$R4(I4+I5)$	$R5 \cdot I5$	—	—	$V=V1+V2+V3+V4+V5$
Extension stage 6	$R1(I1+I2+I3+I4+I5+I6)$	$R2(I2+I3+I4+I5+I6)$	$R3(I3+I4+I5+I6)$	$R4(I4+I5+I6)$	$R5(I5+I6)$	$R6 \cdot I6$	—	$V=V1+V2+V3+V4+V5+V6$
Extension stage 7	$R1(I1+I2+I3+I4+I5+I6+I7)$	$R2(I2+I3+I4+I5+I6+I7)$	$R3(I3+I4+I5+I6+I7)$	$R4(I4+I5+I6+I7)$	$R5(I5+I6+I7)$	$R6(I6+I7)$	$R7 \cdot I7$	$V=V1+V2+V3+V4+V5+V6+V7$

The voltage supplied to "IN" connector of the Q5□B in the final extension reaches 4.75 VDC or higher on the condition that the sum total of voltage drop to "IN" connector of Q5□B (V) is 0.15V or lower.

(2) When the Q6□B is connected between the Q3□B and the Q5□B
(a) Selection condition

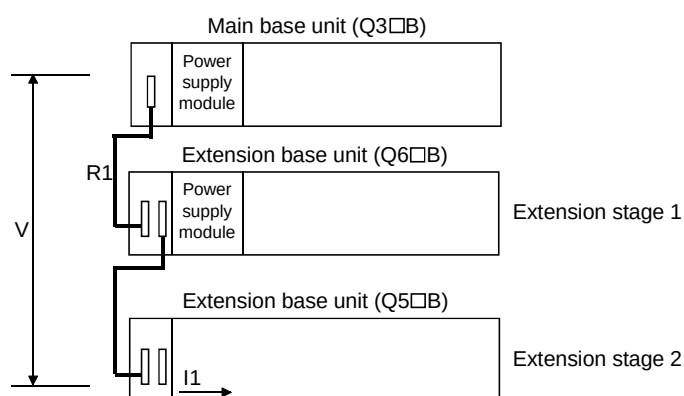
4.75VDC or higher should be supplied to the "IN" connector of the Q5□B in the final extension.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.

Therefore, the Q5□B can be used if the voltage drop is 0.15V or lower
($4.9V - 4.75V = 0.15V$).

[When the Q5□B is connected to Extension stage 2.]



Extension Cable Type	Extension Cable Conductor Resistance (Ω)
QC05B	0.044
QC06B	0.051
QC12B	0.082
QC30B	0.172
QC50B	0.273
QC100B	0.530

Symbol	Description
V	Voltage drop at the extension cable between the main base unit and Q5□B extension base unit
I1	5VDC current consumption when the Q5□B is used as Extension n+1, n = 1 to 6, n: Extension No. of Q6□B connected (Sum total of current consumed by Q5□B and currents consumed by the input/output, intelligent function modules loaded on the Q5□B.)
Rn	Extension cable resistance between the main base unit (or the Q6□B extension base unit) and the Q6□B extension base unit
Rn+1	Extension cable resistance between the Q6□B extension base unit and Q5□B extension base unit

List for Calculating Voltage Drops Occurring at Extension Cables when connecting Q6□B between Q3□B and Q5□B

Position of extension base unit		Voltage drop caused by extension cable from the main base unit to the Q5□B IN connector (V)
Q6□B	Q5□B	
Extension stage 1	Extension stage 2	$V=(R1+R2)I1$
Extension stage 1, Extension stage 2	Extension stage 3	$V=(R1+R2+R3)I1$
Extension stage 1 to 3	Extension stage 4	$V=(R1+R2+R3+R4)I1$
Extension stage 1 to 4	Extension stage 5	$V=(R1+R2+R3+R4+R5)I1$
Extension stage 1 to 5	Extension stage 6	$V=(R1+R2+R3+R4+R5+R6)I1$
Extension stage 1 to 6	Extension stage 7	$V=(R1+R2+R3+R4+R5+R6+R7)I1$

The voltage supplied to the "IN" connector of the Q5□B reaches 4.75 VDC or higher on the condition that the voltage drop (V) at the extension cable between the main base unit and Q5□B is 0.15 VDC or lower.

(3) When the GOT is bus-connected

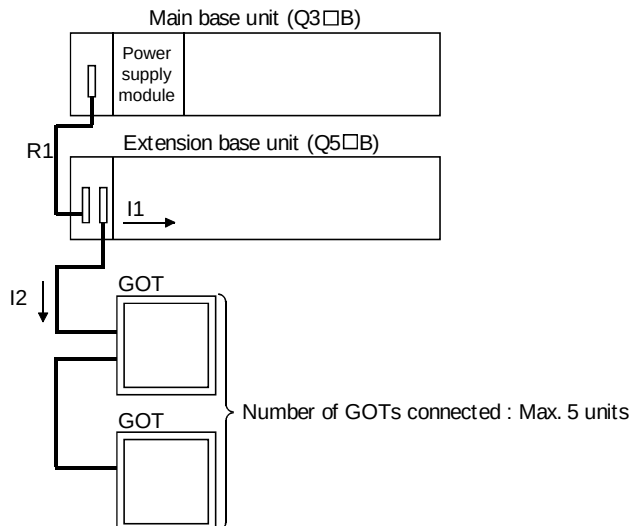
(a) Selection condition

4.75VDC or higher should be supplied to the "IN" connector of the Q5□B.

(b) How to calculate voltage to "IN" connector

The 5VDC output voltage of the power supply module on the main base unit is set to at least 4.90VDC.

Therefore, the Q5□B can be used if the voltage drop is 0.15V or lower ($4.9V - 4.75V = 0.15V$).



Extension Cable Type	Extension Cable Conductor Resistance (Ω)
QC05B	0.044
QC06B	0.051
QC12B	0.082
QC30B	0.172
QC50B	0.273
QC100B	0.530

Symbol	Description
V	Voltage drop at the extension cable between the main base unit and Q5□B extension base unit
I1	5VDC current consumption when the Q5□B is used as Extension n+1, n = 1 to 5, n: Extension No. of the Q6□B connected (Sum total of current consumed by Q5□B and currents consumed by input/output, intelligent function modules loaded on the Q5□B)
I2	5VDC current consumption of the GOT (current consumption per GOT is 254mA) • $I2 = 254 \times c$ (c: Number of GOTs connected (c: 1 to 5))
Rn	Extension cable resistance between the main base unit (or the Q6□B extension base unit) and Q6□B extension base unit
Rn+1	Extension cable resistance between the Q6□B extension base unit and Q5□B extension base unit

POINT
When connecting GOT by extension cable that is 13.2 m (43.31ft) or longer, the bus extension connector box A9GT-QCNB is required. Since the A9GT-QCNB is supplied with 5VDC from the power supply module loaded on the main base unit, 29mA must be added to "I2" as the current consumption of the A9GT-QCNB. For details of the GOT-bus connection, refer to the GOT-A900 Series User's Manual (Connection).

7. MEMORY CARD AND BATTERY

This section describes the specifications and handling of the memory card and battery which can be used on the High Performance model QCPU.

The memory card is necessary for sampling tracing.

The memory card is also used for handling more than the 32768/131072 file registers which can be stored in the standard RAM.

7.1 Memory Card Specifications

The specifications of the memory card which can be used on the High Performance model QCPU adheres to the PCMCIA small PC card.

On the High Performance model QCPU, only one memory card can be installed.

(1) SRAM card

Type	Q2MEM-1MBS
Item	
Memory capacity after format	1011.5 kbyte
Storable number of files	256
Number of insertions and extractions	5000 times
External dimensions[mm(in.)]	42.8(W) × 45(H) × 3.3(D)(1.69(W) × 1.77(H) × 0.13(D))
Weight[g]	15

(2) Flash card

Type	Q2MEM-2MBF	Q2MEM-4MBF
Item		
Memory capacity after format	2032 kbyte	4080 kbyte
Storable number of files	288	
Number of insertions and extractions	5000 times	
Number of writings	100000 times	
External dimensions[mm(in.)]	42.8(W) × 45(H) × 3.3(D)(1.69(W) × 1.77(H) × 0.13(D))	
Weight[g]	15	

(3) ATA card

Type	Q2MEM-8MBA	Q2MEM-16MBA	Q2MEM-32MBA
Item			
Memory capacity after format	7940 kbyte	15932 kbyte	31854 kbyte
Storable number of files	512		
Number of insertions and extractions	5000 times		
Number of writings	1000000 times		
External dimensions[mm(in.)]	42.8(W) × 45(H) × 3.3(D)(1.69(W) × 1.77(H) × 0.13(D))		
Weight[g]	15		

7.2 Battery Specifications (For CPU Module and SRAM Card)

(1) For CPU module

Item \ Type	Q6BAT
Classification	Manganese dioxide lithium primary battery
Initial voltage (V)	3.0
Nominal current (mAh)	1800
Storage life	10 years (room temperature)
Total power interrupt time	Refer to Section 10.3.1.
Application	Power interrupt hold-on function of the program memory and standard RAM

(2) For SRAM card

Item \ Type	Q2MEM-BAT
Classification	Graphite fluoride primary battery
Initial voltage (V)	3.0
Nominal current (mAh)	48
Storage life	4 years (room temperature)
Total power interrupt time	Refer to Section 10.3.1.
Application	Power interrupt hold-on function of the SRAM memory card

7.3 Handling the Memory Card

(1) Formatting of memory card

All the memory cards used on the High Performance model QCPU must be formatted.

Because the memory card you purchased is unformatted, format it by the GX Developer before use.

For the formatting procedure, see the Operating Manual of the GX Developer.

(2) Installation of SRAM card battery

A power interrupt hold-on battery is furnished with the SRAM card you purchased.

Before using the SRAM card, install the battery.

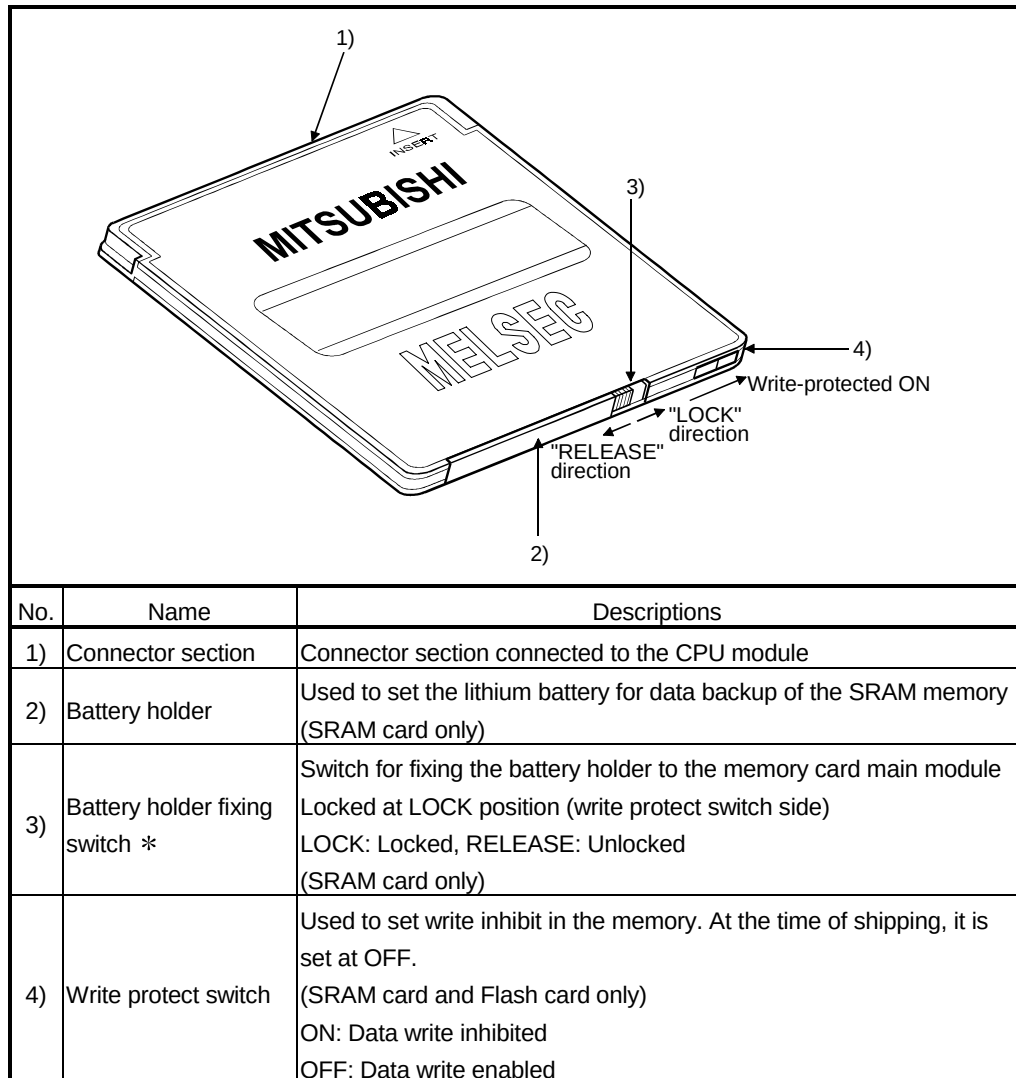
POINTS
Even if the battery is installed on the CPU main module, if a battery is not installed on the SRAM card, the memory of the SRAM card will not be backed up. Ensure to install the battery on the SRAM card. Also, even if the battery is installed on the SRAM card, if a battery is not installed on the CPU main module, the program memory of the CPU module and the memory of the standard RAM will not be backed up. Do not fail to install the battery on the CPU main module.

(3) Kind of file which can be stored on memory card

Please refer to the High Performance model QCPU (Q mode) User's Manual (Function Explanation, Program Fundamentals) of section 6.1 for the kind of the file which can be stored on each memory card.

7.4 The Names of The Parts of The Memory Card

The names of the parts of the memory card are described below.

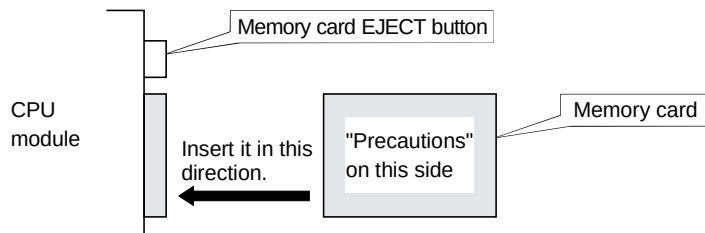


*: The battery holder fixing switch is returned automatically from RELEASE to LOCK when the battery holder is disconnected.

7.5 Memory Card Loading/Unloading Procedures

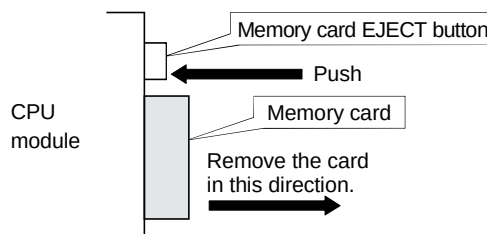
(1) To install the memory card

To install the memory card into the CPU module, insert the memory card securely into the connector until the height of the memory card reaches that of the memory card EJECT button. In this case, take care of the orientation of the memory card.



(2) To remove the memory card

To remove the memory card from the CPU module, press the memory card EJECT button to push out the card.



(3) To extract the memory card while the power is turned on

- 1) Turn on the special relay "SM609" using the sequence program or by the device test of the peripheral devices.
- 2) By monitoring the peripheral devices, check that the special relays "SM604" and "SM605" are turned off.
- 3) Extract the memory card.

* SM604 (memory card use flag) : The system is turned on when the CPU module uses a memory card.

SM605 (memory card detach inhibit flag) : This is turned on by the user to disable the memory card from being detached.

(4) To install the memory card while the power is turned on

- 1) Install the memory card.

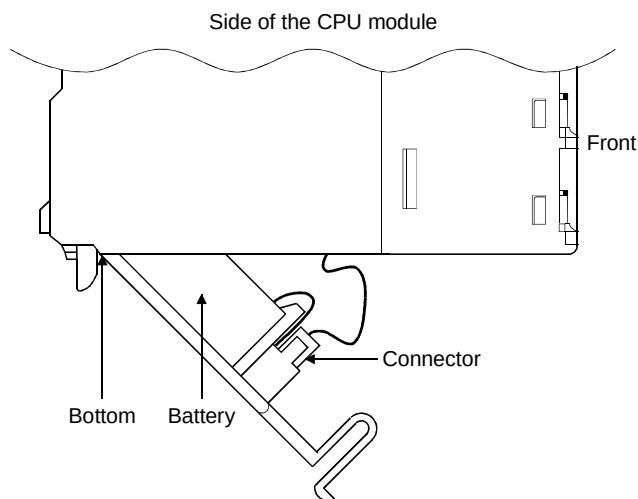
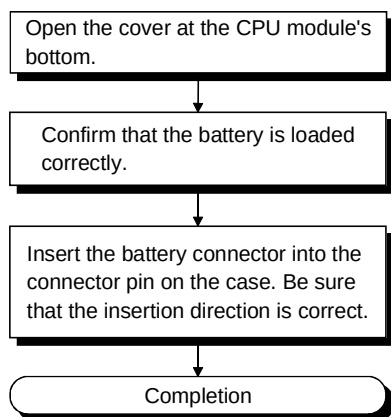
POINTS

Install and remove the memory card while the power is turned on, paying attention to the following.

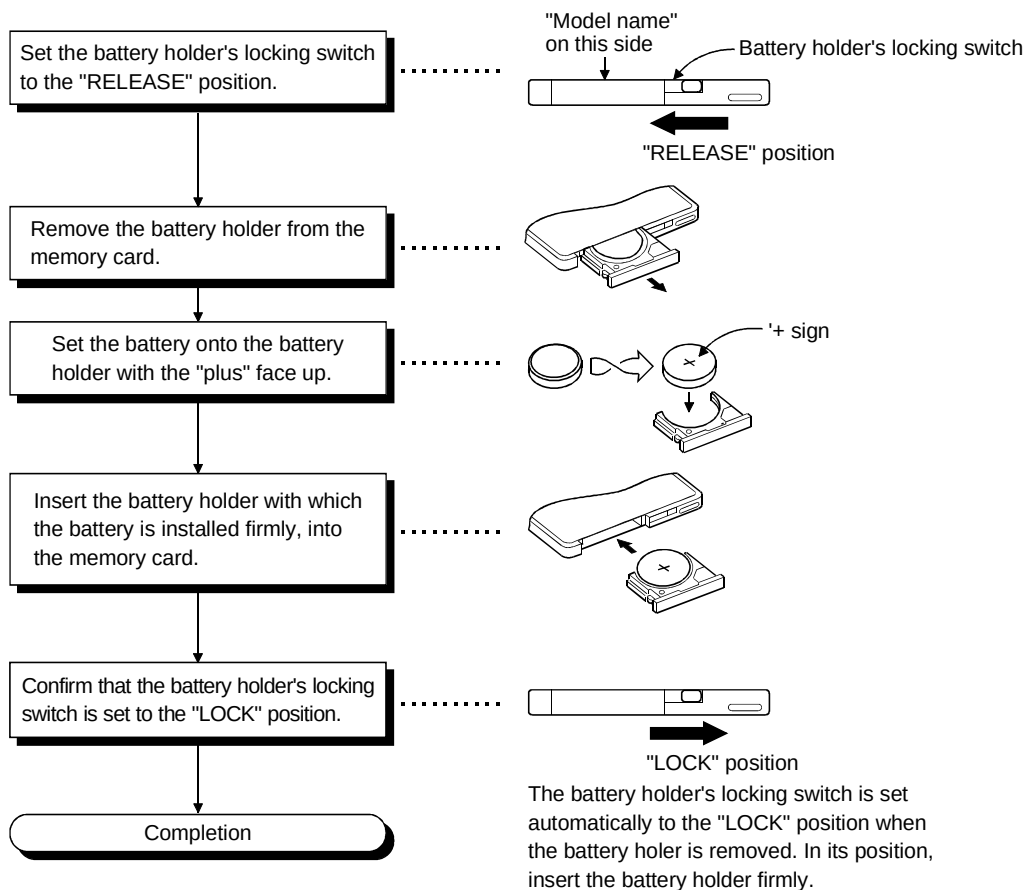
- (1) If the procedures specified above are not followed, the data stored in the memory card may be destroyed.
When the CPU module operation at the time of occurrence of a parameter error is set to STOP, the CPU module operation is stopped by the occurrence of ICM.OPE.ERROR.
- (2) When the memory card is installed, its mount processing is performed again.
As a result, the scanning time is increased by several 10 ms max.

7.6 Installation of Battery (for CPU Module and Memory Card)

- (1) The battery for the CPU module is shipped with its connector disconnected.
Connect the connector as follows.
Refer to Section 10.3 for the service life of the battery and how to replace the battery.



- (2) The battery for the SRAM card is shipped separately from the battery holder.
Before using the SRAM card, set the battery in the battery holder as follows.



8. EMC AND LOW-VOLTAGE DIRECTIVES

For the products sold in European countries, the conformance to the EMC Directive, which is one of the European Directives, has been a legal obligation since 1996. Also, conformance to the Low Voltage Directive, another European Directives, has been a legal obligation since 1997.

Manufacturers who recognize their products must conform to the EMC and Low Voltage Directives required to declare that their products conform to these Directives and put a "CE mark" on their products.

8.1 Requirements for conformance to EMC Directive

The EMC Directive specifies that products placed on the market must "be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity)".

The applicable products are requested to meet these requirements. The sections 8.1.1 through 8.1.6 summarize the precautions on conformance to the EMC Directive of the machinery constructed using the MELSEC-Q series PLCs.

The details of these precautions has been prepared based on the requirements and the applicable standards control. However, we will not assure that the overall machinery manufactured according to these details conforms to the above-mentioned directives. The method of conformance to the EMC directive and the judgment on whether or not the machinery conforms to the EMC Directive must be determined finally by the manufacturer of the machinery.

8.1.1 Standards applicable to the EMC Directive

The standards applicable to the EMC Directive are listed below.

Specification	Test item	Test details	Standard value
EN50081-2 : 1995	EN55011 Radiated noise * 2	Electromagnetic emissions from the product are measured.	30 M-230 MHz QP : 30 dB μ V/m (30 m in measurement range) * 1 230 M-1000 MHz QP : 37 dB μ V/m (30 m in measurement range)
	EN55011 Conducted noise	Electromagnetic emissions from the product to the power line is measured.	150 k-500 kHz QP : 79 dB, Mean : 66 dB * 1 500 k-30 MHz QP : 73 dB, Mean : 60 dB
EN61131-2 : 1996	EN61000-4-2 Electrostatic immunity * 2	Immunity test in which static electricity is applied to the cabinet of the equipment.	15 k V Aerial discharge
	EN61000-4-4 Fast transient burst noise * 2	Immunity test in which burst noise is applied to the power line and signal lines.	Power line : 2 kV Digital I/O (24 V or higher) : 1 kV (Digital I/O (24 V or less)) > 250 V (Analog I/O, signal lines) > 250 V
	EN61000-4-3 Radiated field AM modulation * 2	Immunity test in which field is irradiated to the product.	10 V/m, 26-1000 MHz, 80%AM modulation@1 kHz
	EN61000-4-12 Damped oscillatory wave immunity	Immunity test in which a damped oscillatory wave is superimposed on the power line.	Power line : 1 kV Digital I/O (24 V or higher) : 1 kV

(*1) QP : Quasi-peak value, Mean : Average value

(*2) The PLC is an open type device (device installed to another device) and must be installed in a conductive control panel.
The tests for the corresponding items were performed while the PLC was installed inside a control panel.

8.1.2 Installation instructions for EMC Directive

The PLC is open equipment and must be installed within a control cabinet for use. This not only ensures safety but also ensures effective shielding of PLC-generated electromagnetic noise.

(1) Control cabinet

- (a) Use a conductive control cabinet.
- (b) When attaching the control cabinet's top plate or base plate, mask painting and weld so that good surface contact can be made between the cabinet and plate.
- (c) To ensure good electrical contact with the control cabinet, mask the paint on the installation bolts of the inner plate in the control cabinet so that contact between surfaces can be ensured over the widest possible area.
- (d) Earth the control cabinet with a thick wire so that a low impedance connection to ground can be ensured even at high frequencies.
- (e) Holes made in the control cabinet must be 10 cm (3.94 in.) diameter or less. If the holes are 10 cm (3.94 in.) or larger, radio frequency noise may be emitted.

In addition, because radio waves leak through a clearance between the control panel door and the main unit, reduce the clearance as much as practicable.

The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Our tests have been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3 m method with 30 to 300 MHz).

(2) Connection of power and earth wires

Earthing and power supply wires for the PLC system must be connected as described below.

- (a) Provide an earthing point near the power supply module. Earth the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30 cm (11.18 in.) or shorter.) The LG and FG terminals function is to pass the noise generated in the PLC system to the ground, so an impedance that is as low as possible must be ensured. As the wires are used to relieve the noise, the wire itself carries a large noise content and thus short wiring means that the wire is prevented from acting as an antenna.
- (b) The earth wire led from the earthing point must be twisted with the power supply wires. By twisting with the earthing wire, noise flowing from the power supply wires can be relieved to the earthing. However, if a filter is installed on the power supply wires, the wires and the earthing wire may not need to be twisted.

8.1.3 Cables

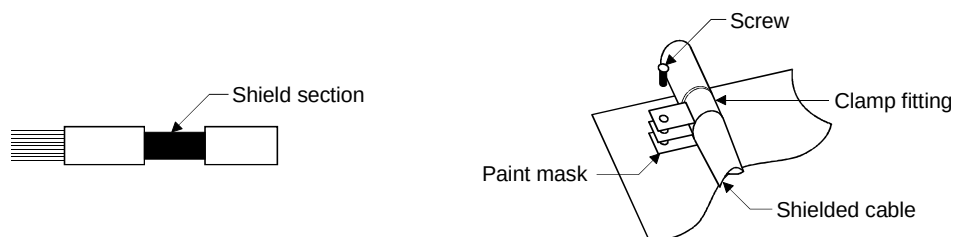
The cables extracted from the control panel contain a high frequency noise component. On the outside of the control panel, therefore, they serve as antennas to emit noise. To prevent noise emission, use shielded cable for the cables which are connected to the input/output modules and intelligent function modules and may be extracted to the outside of the control panel.

The use of a shielded cable also increases noise resistance. The signal lines connected to the PLC input/output modules and intelligent function modules use shielded cables to assure noise resistance under the conditions where the shield is earthed. If a shielded cable is not used or not earthed correctly, the noise resistance will not meet the specified requirements.

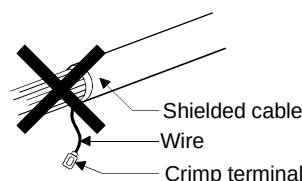
When the shield of a shielded cable is earthed to the cabinet body, please ensure that the shield contact with the body is over a large surface area. If the cabinet body is painted it will be necessary to remove paint from the contact area. All fastenings must be metallic and the shield and earthing contact must be made over the largest available surface area. If the contact surfaces are too uneven for optimal contact to be made either use washers to correct for surface inconsistencies or use an abrasive to level the surfaces. The following diagrams show examples of how to provide good surface contact of shield earthing by use of a cable clamp.

(1) Earthing of shielded of shield cable

- (a) Earth the shield of the shielded cable as near the module as possible taking care so that the earthed cables are not induced electromagnetically by the cable to be earthed.
- (b) Take an appropriate measures so that the shield section of the shielded cable from which the outer cover was partly removed for exposure is earthed to the control panel on an increased contact surface. A clamp may also be used as shown in the figure below. In this case, however, apply a cover to the painted inner wall surface of the control panel which comes in contact with the clamp.

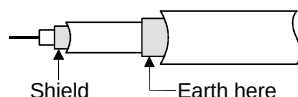


Note) The method of earthing by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



(2) MELSECNET/H module

Always use a double-shielded coaxial cable (MITSUBISHI CABLE : 5C-2V-CCY) for the coaxial cables MELSECNET/H module. Radiated noise in the range of 30MHz or higher can be suppressed by use of the double-shielded coaxial cables. Earth the double-shielded coaxial cable by connecting its outer shield to the ground.



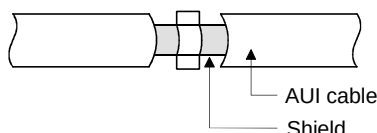
Refer to (1) for the earthing of the shield.

(3) Ethernet module

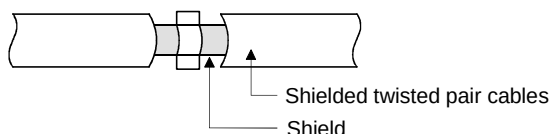
Precautions for using AUI cables, twisted pair cables and coaxial cables are described below.

(a) Always earth the AUI cables connected to the 10BASE5 connectors.

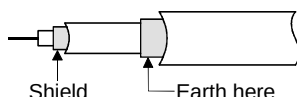
Because the AUI cable is of the shielded type, strip part of the outer cover and earth the exposed shield section to the ground on the widest contact surface as shown below.



Refer to (1) for the earthing of the shield.

(b) Use shielded twisted pair cables as the twisted pair cables connected to the 10BASE-T connectors. For the shielded twisted pair cables, strip part of the outer cover and earth the exposed shield section to the ground on the widest contact surface as shown below.

Refer to (1) for the earthing of the shield.

(c) Always use double-shielded coaxial cables as the coaxial cables connected to the 10BASE2 connectors. Earth the double-shielded coaxial cable by connecting its outer shield to the ground.

Refer to (1) for the earthing of the shield.

Ethernet is the registered trademark of XEROX, Co., LTD

(4) I/O signal lines and other communication cables

For the I/O signal lines and other communication cables lines (RS-232, RS-422, CC-Link, etc.), if extracted to the outside of the control panel, also ensure to earth the shield section of these lines and cables in the same manner as in item (1) above.

8.1.4 Power supply module

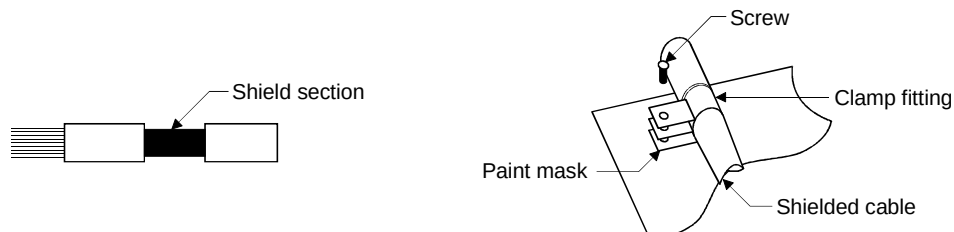
Always ground the LG and FG terminals after short-circuiting them.

8.1.5 When using Q1AS6 □ B type base unit

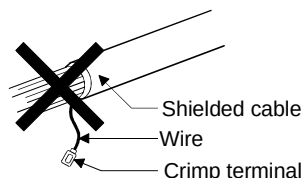
(1) Cable

(a) Earthing of shielded cable

- Earth the shield of the shielded cable as near the unit as possible taking care so that the earthed cables are not induced electromagnetically by the cable to be earthed.
- Take appropriate measures so the shield that was partly removed for exposure is earthed to the control panel over a large contact surface area. A clamp may also be used as shown in the figure below. In this case, however, apply a cover to the painted inner wall surface of the control panel which comes in contact with the clamp.

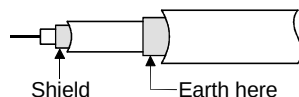


Note) The method of earthing by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



(b) MELSECNET (II) units

- 1) Use a double-shielded coaxial cable (Mitsubishi Cable: 5C-2V-CCY) for the MELSECNET (II) unit which uses coaxial cable. Noise in the range of 30 MHz or higher in radiation noise can be suppressed by the use of double-shielded coaxial cables. Earth the outer shield to the ground.



Refer to (a) for the earthing of the shield.

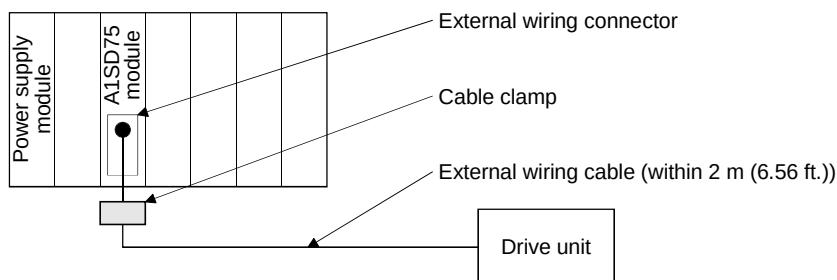
- 2) Always attach a ferrite core to the double-shielded coaxial cable connected to the MELSECNET unit. In addition, position the ferrite core on each cable near the outlet of the control panel. TDK make ZCAT3035 ferrite core is recommended.

(c) Positioning Modules

Precautions to be followed when the machinery conforming to the EMC Directive is configured using the A1SD75P1-S3/A1SD75P2-S3/A1SD75P3-S3 (hereafter referred to as the A1SD75) are described below.

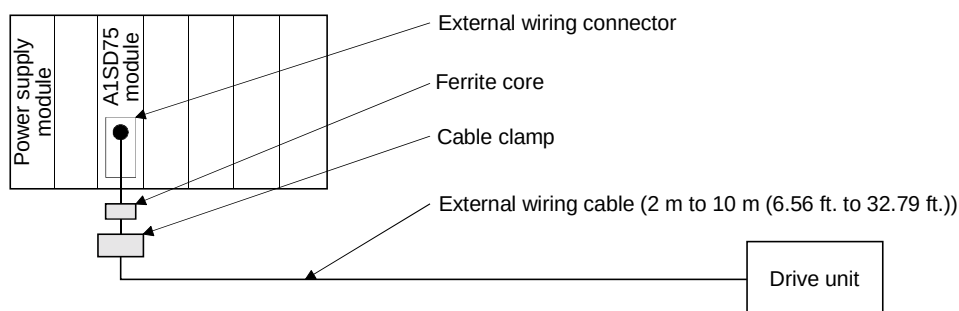
1) When wiring with a 2 m (6.56 ft.) or less cable

- Ground the shield section of the external wiring cable with the cable clamp. (Ground the shield at the closest location to the A1SD75 external wiring connector.)
- Wire the external wiring cable to the drive unit and external device with the shortest practicable length of cable.
- Install the drive unit in the same panel.



2) When wiring with cable that exceeds 2 m (6.56 ft.), but is 10 m (32.79 ft.) or less

- Ground the shield section of the external wiring cable with the cable clamp. (Ground the shield at the closest location to the A1SD75 external wiring connector.)
- Install a ferrite core.
- Wire the external wiring cable to the drive unit and external device with the shortest practicable length of cable.



3) Ferrite core and cable clamp types and required quantities

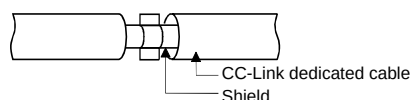
- Cable clamp
Type : AD75CK (Mitsubishi Electric)
- Ferrite core
Type : ZCAT3035-1330 (TDK ferrite core)
- Required quantity

Cable length	Prepared part	Required Qty		
		1 axis	2 axes	3 axes
Within 2 m (6.56 ft.)	AD75CK	1	1	1
2 m (6.56 ft.) to 10m (32.79ft.)	AD75CK	1	1	1
	ZCAT3035-1330	1	2	3

(d) CC-Link Module

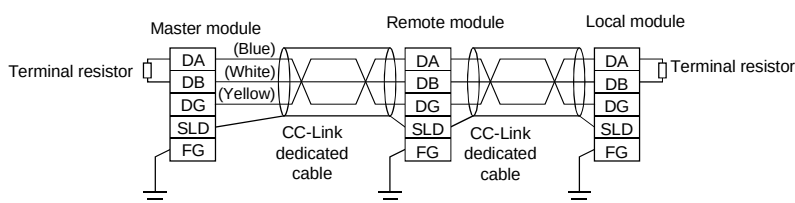
- 1) Be sure to ground the cable shield that is connected to the CC-Link module close to the exit of control panel or to any of the CC-Link stations within 30 cm (11.8 in.) from the module or stations.

The CC-Link dedicated cable is a shielded cable. As shown in the illustration below, remove a portion of the outer covering and ground as large a surface area of the exposed shield part as possible.



- 2) Always use the specified CC-Link dedicated cable.
- 3) Do not use a ferrite core for the CC-Link module or CC-Link stations.
- 4) The CC-Link module, the CC-Link stations and the FG line inside the control panel should be connected at both the FG terminal and the SLD terminal as shown in the diagram below.

[Simplified diagram]

**(e) I/O signal lines**

For the I/O signal lines, if extracted to the outside of the control panel, also ensure to earth the shield section of these lines and cables in the same manner as in item (1) above.

(2) Power supply module

The precautions required for each power supply module are described below. Always observe the items noted as precautions.

Model	Precautions
A1S61P A1S62P	Not usable
A1S63P (*1)	Use the 24 VDC panel power equipment conforming to the EU Directive.
A1S61PEU A1S62PEU A1S61PN A1S62PN	Always ground the LG and FG terminals after short-circuiting them.

- (*1) If sufficient filter circuitry is built into the 24 VDC external power supply module, the noise generated by A1S63P will be absorbed by that filter circuit, so a line filter may not be required.
Filtering circuitry of version F or later of A1S63P is improved so that a external line filter is not required.

8.1.6 Others

(1) Ferrite core

A ferrite core has the effect of reducing radiated noise in the 30 M Hz to 100 M Hz band.

It is not required to fit ferrite cores to cables, but it is recommended to fit ferrite cores if shield cables pulled out of the enclosure do not provide sufficient shielding effects.

It should be noted that the ferrite cores should be fitted to the cables in the position immediately before they are pulled out of the enclosure. If the fitting position is improper, the ferrite will not produce any effect.

In the CC-Link system, however, ferrite cores cannot be fitted to cables.

(2) Noise filter (power supply line filter)

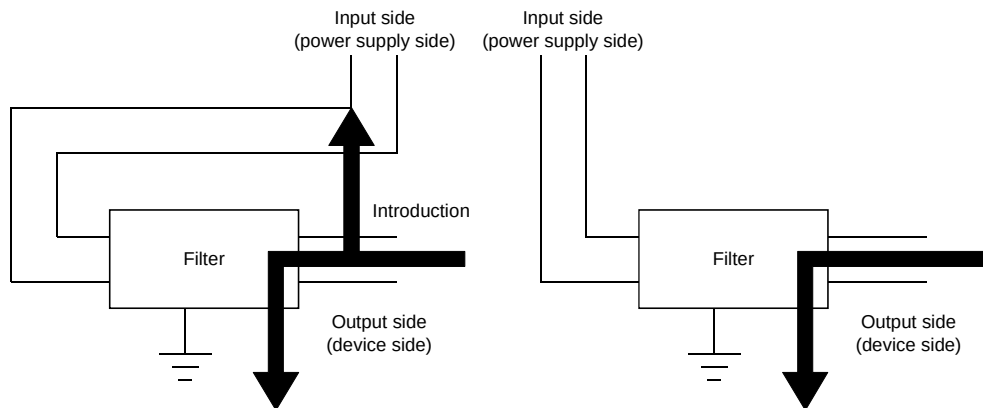
A noise filter is a component which has an effect on conducted noise.

It is not required to fit the noise filter to the power supply line, but fitting it can further suppress noise.

(The noise filter has the effect of reducing conducted noise of 10 MHz or less.)

The precautions required when installing a noise filter are described below.

- (a) Do not bundle the wires on the input side and output side of the noise filter. When bundled, the output side noise will be induced into the input side wires from which the noise was filtered.



1) The noise will be included when the input and output wires are bundled.

2) Separate and lay the input and output wires.

- (b) Earth the noise filter earthing terminal to the control cabinet with the shortest wire possible (approx. 10 cm (3.94 in.)).

Reference

Noise Filter Model Name	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3 A	6 A	3 A
Rated voltage	250 V		

8.2 Requirement to Conform to the Low-Voltage Directive

The low-voltage directive requires each device that operates with the power supply ranging from 50V to 1000VAC and 75V to 1500VDC to satisfy the safety requirements. In Sections 8.2.1 to 8.2.6, cautions on installation and wiring of the MELSEC-Q series PLC to conform to the low-voltage directive are described.

We have put the maximum effort to develop this material based on the requirements and standards of the regulation that we have collected. However, compatibility of the devices which are fabricated according to the contents of this manual to the above regulation is not guaranteed. Each manufacturer who fabricates such device should make the final judgement about the application method of the low-voltage directive and the product compatibility.

8.2.1 Standard applied for MELSEC-Q series PLC

The standard applied for MELSEC-Q series PLC is EN61010-1 safety of devices used in measurement rooms, control rooms, or laboratories.

The MELSEC-Q series PLC modules which operate at the rated voltage of 50VAC/75VDC or above are also developed to conform to the above standard.

The modules which operate at the rated voltage of less than 50VAC/75VDC are out of the low-voltage directive application range.

8.2.2 MELSEC-Q series PLC selection

(1) Power module

There are dangerous voltages (voltages higher than 42.4V peak) inside the power supply modules of the 100/200VAC rated I/O voltages. Therefore, the CE mark-compliant models are enhanced in insulation internally between the primary and secondary.

(2) Input/output module

There are dangerous voltages (voltages higher than 42.4V peak) inside the I/O modules of the 100/200VAC rated I/O voltages. Therefore, the CE mark-compliant models are enhanced in insulation internally between the primary and secondary.

The I/O modules of 24VDC or less rating are out of the low-voltage directive application range.

(3) CPU module, memory card, base unit

Using 5VDC circuits inside, the above modules are out of the low-voltage directive application range.

(4) Intelligent function modules (special function modules)

The intelligent function modules (special function modules) such as the analog, network and positioning modules are 24VDC or less in rated voltage and are therefore out of the low-voltage directive application range.

(5) Display device

Use the display conforming to the EU directive.

8.2.3 Power supply

The insulation specification of the power module was designed assuming installation category II. Be sure to use the installation category II power supply to the PLC. The installation category indicates the durability level against surge voltage generated by a thunderbolt. Category I has the lowest durability; category IV has the highest durability.

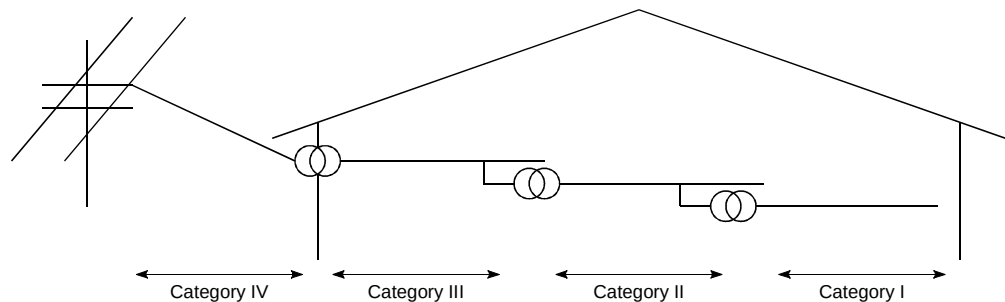


Figure 8.1: Installation Category

Category II indicates a power supply whose voltage has been reduced by two or more levels of isolating transformers from the public power distribution.

8.2.4 Control box

Because the PLC is an open device (a device designed to be stored within another module), be sure to use it after storing in the control box.

(1) Electrical shock prevention

In order to prevent persons who are not familiar with the electric facility such as the operators from electric shocks, the control box must have the following functions :

- (a) The control box must be equipped with a lock so that only the personnel who has studied about the electric facility and have enough knowledge can open it.
- (b) The control box must have a structure which automatically stops the power supply when the box is opened.

(2) Dustproof and waterproof features

The control box also has the dustproof and waterproof functions. Insufficient dustproof and waterproof features lower the insulation withstand voltage, resulting in insulation destruction. The insulation in our PLC is designed to cope with the pollution level 2, so use in an environment with pollution level 2 or below.

Pollution level 1 : An environment where the air is dry and conductive dust does not exist.

Pollution level 2 : An environment where conductive dust does not usually exist, but occasional temporary conductivity occurs due to the accumulated dust. Generally, this is the level for inside the control box equivalent to IP54 in a control room or on the floor of a typical factory.

Pollution level 3 : An environment where conductive dust exists and conductivity may be generated due to the accumulated dust.
An environment for a typical factory floor.

Pollution level 4 : Continuous conductivity may occur due to rain, snow, etc. An outdoor environment.

As shown above, the PLC can realize the pollution level 2 when stored in a control box equivalent to IP54.

8.2.5 Grounding

There are the following two different grounding terminals. Use either grounding terminal in an earthed status.

Protective grounding  : Maintains the safety of the PLC and improves the noise resistance.

Functional grounding  : Improves the noise resistance.

8.2.6 External wiring

(1) 24 VDC external power supply

For the MELSEC-Q series 24VDC I/O modules and the intelligent function modules (special function modules) which require external supply power, use a model whose 24 VDC circuit is intensively insulated from the hazardous voltage circuit.

(2) External devices

When a device with a hazardous voltage circuit is externally connected to the PLC, use a model whose circuit section of the interface to the PLC is intensively insulated from the hazardous voltage circuit.

(3) Intensive insulation

Intensive insulation refers to the insulation with the dielectric withstand voltage shown in Table 8.1.

Table 8.1 : Intensive Insulation Withstand Voltage
(Installation Category II, source : IEC664)

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50 μ s)
150 VAC or below	2500 V
300 VAC or below	4000 V

9. LOADING AND INSTALLATION

In order to increase the reliability of the system and exploit the maximum performance of its functions, this section describes the methods and precautions for the mounting and installation of the system.

9.1 General Safety Requirements



DANGER

- Install a safety circuit external to the PLC that keeps the entire system safe even when there are problems with the external power supply or the PLC module. Otherwise, trouble could result from erroneous output or erroneous operation.
- (1) Outside the PLC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward/reverse operations.
- (2) When the PLC detects the following problems, it will stop calculation and turn off all output in the case of (a). In the case of (b), it will stop calculation and hold or turn off all output according to the parameter setting.
 Note that the A1S series module will turn off the output in either of cases (a) and (b).
 All outputs of AnS Series Module will be switched off in the following cases:
 (a) The power supply module has over current protection equipment and over voltage protection equipment.
 (b) The PLC CPUs self-diagnostic functions, such as the watchdog timer error, detect problems.
 In addition, all output will be turned on when there are problems that the PLC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PLC that will make sure the equipment operates safely at such times. For fail safe circuit examples, refer to "LOADING AND INSTALLATION" in this manual.
- (3) Output could be left on or off when there is trouble in the outputs module relay or transistor. So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.
- When overcurrent which exceeds the rating or caused by short-circuited load flows in the output module for a long time, it may cause smoke or fire. To prevent this, configure an external safety circuit, such as fuse.
- Build a circuit that turns on the external power supply when the PLC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.
- When there are communication problems with the data link, refer to the corresponding data link manual for the operating status of each station. Not doing so could result in erroneous output or erroneous operation.

**DANGER**

- When connecting a peripheral device to the CPU module or connecting a personal computer or the like to the special function module to exercise control (data change) on the running PLC, configure up an interlock circuit in the sequence program to ensure that the whole system will always operate safely.
Also before exercising other control (program change, operating status change (status control)) on the running PLC, read the manual carefully and fully confirm safety.
Especially for the above control on the remote PLC from an external device, an immediate action may not be taken for PLC trouble due to a data communication fault.
In addition to configuring up the interlock circuit in the sequence program, corrective and other actions to be taken as a system for the occurrence of a data communication fault should be predetermined between the external device and PLC CPU.

**CAUTION**

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100 mm (3.94 inch) or more from each other.
Not doing so could result in noise that would cause erroneous operation.
- When controlling items like lamp load, heater or solenoid valve using an output module, large current (approximately ten times greater than that present in normal circumstances) may flow when the output is turned OFF to ON. Take measures such as replacing the module with one having sufficient rated current.

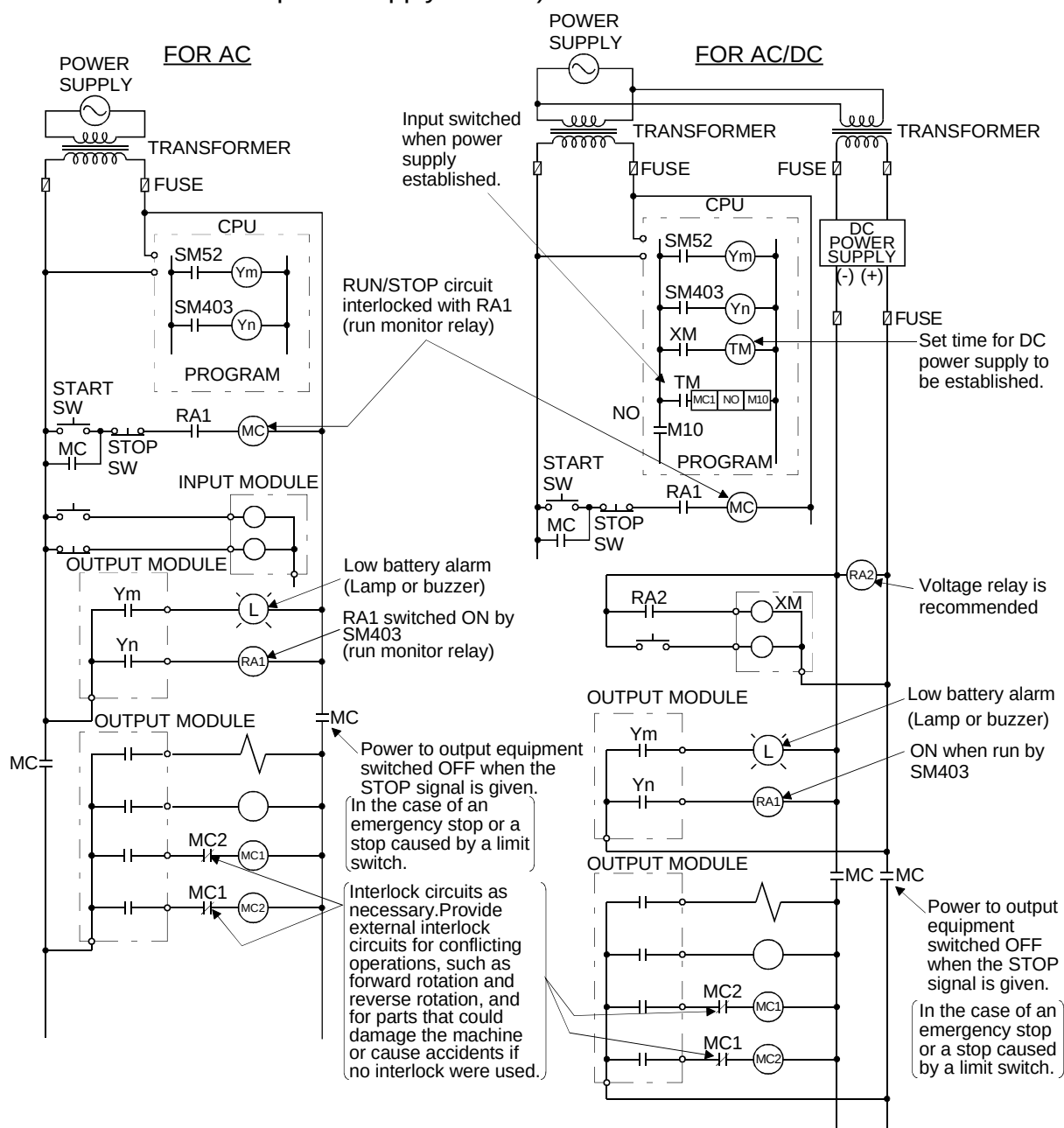
When the PLC power supply is switched ON-OFF, proper process output may not be provided temporarily due to differences in delay time and starting time between the PLC power supply and processing external power supply (especially DC).

For example, if the processing external supply power is switched on in a DC output module and the PLC power supply is then switched on, the DC output module may provide false output instantaneously at power-on of the PLC. Therefore, it is necessary to make up a circuit which can switch on the PLC power supply first.

Also, an abnormal operation may be performed if an external power supply fault or PLC failure takes place.

To prevent any of these abnormal operations from leading to the abnormal operation of the whole system and in a fail-safe viewpoint, areas which can result in machine breakdown and accidents due to abnormal operations (e.g. emergency stop, protective and interlock circuits) should be constructed outside the PLC.

The following page gives examples of system designing in the above viewpoint.

(1) System design circuit example (when not using $\overline{\text{ERR}}$ contact of power supply module)

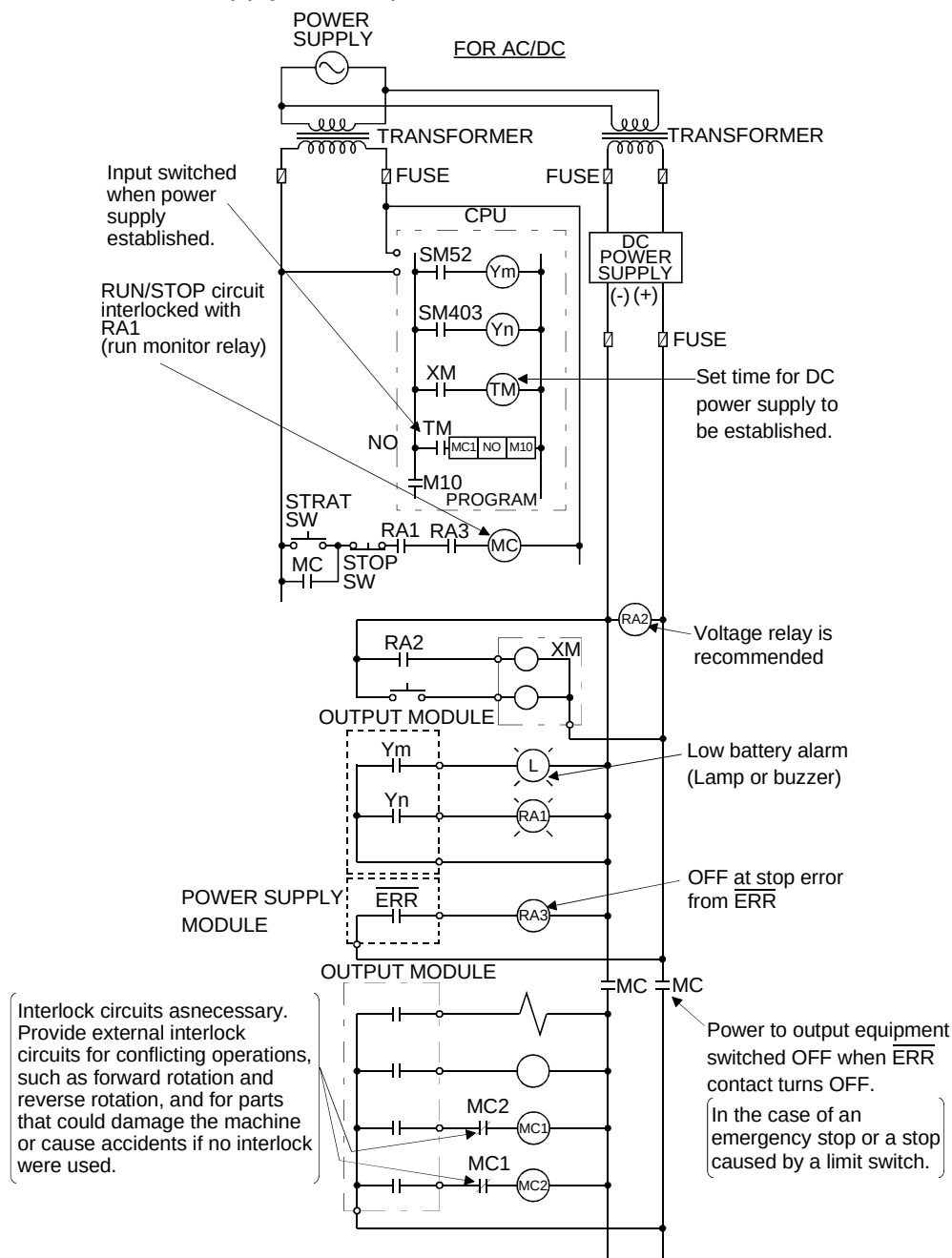
The power-ON procedure is as follows:

For AC

- 1) Switch power ON.
- 2) Set CPU to RUN.
- 3) Turn ON the start switch.
- 4) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program.

For AC/DC

- 1) Switch power ON.
- 2) Set CPU to RUN.
- 3) When DC power is established, RA2 goes ON.
- 4) Timer (TM) times out after the DC power reaches 100%. (The TM set value should be the period of time from when RA2 goes ON to the establishment of 100% DC voltage. Set this value to approximately 0.5 seconds.)
- 5) Turn ON the start switch.
- 6) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program. (If a voltage relay is used at RA2, no timer (TM) is required in the program.)

(2) System design circuit example (when using $\overline{\text{ERR}}$ contact of power supply module)

The power-ON procedure is as follows:

For AC/DC

- 1) Switch power ON.
- 2) Set CPU to RUN.
- 3) When DC power is established, RA2 goes ON.
- 4) Timer (TM) times out after the DC power reaches 100%. (The TM set value should be the period of time from when RA2 goes ON to the establishment of 100% DC voltage. Set this value to approximately 0.5s.)
- 5) Turn ON the start switch.
- 6) When the magnetic contactor (MC) comes on, the output equipment is powered and may be driven by the program. (If a voltage relay is used at RA2, no timer (TM) is required in the program.)

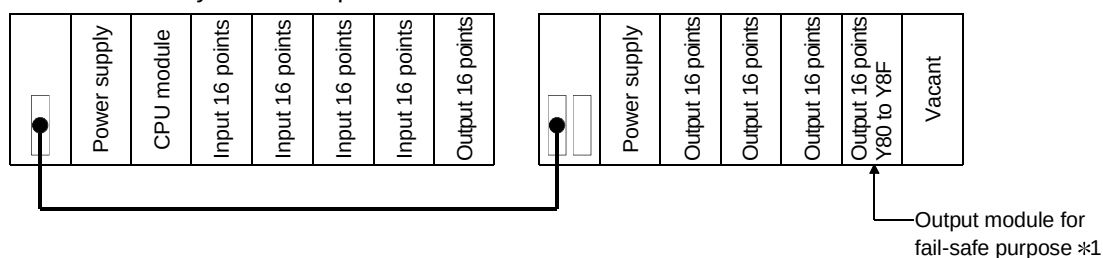
(3) Fail-safe measures against failure of the PLC

Failure of a CPU module or memory can be detected by the self diagnosis function. However, failure of I/O control area may not be detected by the CPU module.

In such cases, all I/O points turn ON or OFF depending on a condition of problem, and normal operating conditions and operating safety cannot sometimes be maintained.

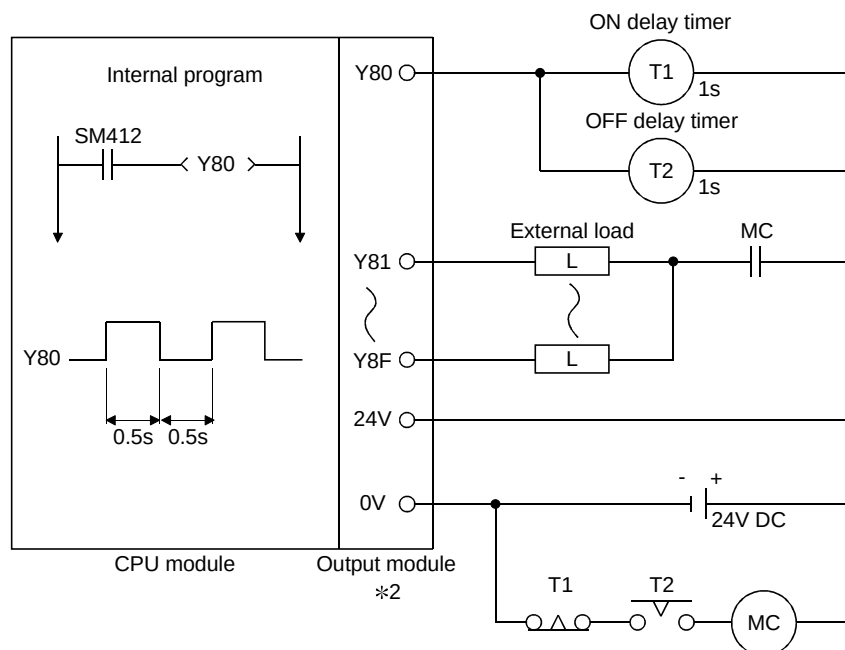
Though Mitsubishi PLCs are manufactured under strict quality control, they may cause failure or abnormal operations due to unspecific reasons. To prevent the abnormal operation of the whole system, machine breakdown, and accidents, fail-safe circuitry against failure of the PLC must be constructed outside the PLC. Examples of a system and its fail-safe circuitry are described below:

<System example>



*1: The output module for fail-safe purpose should be loaded in the last slot of the system. (Y80 to Y8F in the above system.)

<Fail-safe circuit example>



*2: Y80 repeats turning ON and then OFF at 0.5s intervals.

Use a no-contact output module (transistor in the example shown above).

9.2 Calculating Heat Generation by PLC

The ambient temperature inside the board storing the PLC must be suppressed to a PLC usable ambient temperature of 55°C.

For the design of radiation from the storing board, it is necessary to know the average power consumption (heating value) of the devices and instruments stored in the board. Here the method of obtaining the average power consumption of the High Performance model QCPU system is described.

From the power consumption, calculate a rise in ambient temperature inside the board.

How to calculate average power consumption

The power consuming parts of the PLC are roughly classified into six blocks as shown below.

(1) Power consumption of power supply module

The power conversion efficiency of the power module is approx. 70 %, i.e., 30 % of the output power is consumed by heating. As a result, 3/7 of the output power becomes the power consumption. Therefore the calculation formula is as follows.

$$W_{pw} = \frac{3}{7} \times (I_{5V} \times 5) \text{ (W)}$$

I_{5V} : Current consumption of logic 5 VDC circuit of each module

(2) Power consumption of a total of 5 VDC logic section of each module

The power consumption of the 5 VDC output circuit section of the power module is the power consumption of each module (including the current consumption of the base unit).

$$W_{5V} = I_{5V} \times 5 \text{ (W)}$$

(3) A total of 24 VDC average power consumption of the output module (power consumption for simultaneous ON points)

The average power of the external 24 VDC power is the total power consumption of each module.

$$W_{24V} = I_{24V} \times 24 \text{ (W)}$$

(4) Average power consumption due to voltage drop in the output section of the output module (Power consumption for simultaneous ON points)

$$W_{OUT} = I_{OUT} \times V_{drop} \times \text{Number of outputs} \times \text{Simultaneous ON rate (W)}$$

I_{OUT} : Output current (Current in actual use) (A)

V_{drop} : Voltage drop in each output module (V)

(5) Average power consumption of the input section of the input module (Power consumption for simultaneous ON points)

$$W_{IN} = I_{IN} \times E \times \text{Number of input points} \times \text{Simultaneous ON rate (W)}$$

I_{IN} : Input current (Effective value for AC) (A)

E : Input voltage (Voltage in actual use) (V)

(6) Power consumption of the power supply section of the intelligent function module

$$W_S = I_{5V} \times 5 + I_{24V} \times 24 + I_{100V} \times 100 \text{ (W)}$$

The total of the power consumption values calculated for each block becomes the power consumption of the overall sequencer system.

$$W = W_{PW} + W_{5V} + W_{24V} + W_{OUT} + W_{IN} + W_S \text{ (W)}$$

From this overall power consumption (W), calculate the heating value and a rise in ambient temperature inside the board.

The outline of the calculation formula for a rise in ambient temperature inside the board is shown below.

$$T = \frac{W}{UA} \text{ (}^\circ\text{C)}$$

W : Power consumption of overall sequencer system (value obtained above)

A : Surface area inside the board

U : When the ambient temperature inside the board is uniformed by a fan 6
When air inside the board is not circulated 4

POINT

When a rise in ambient temperature inside the board exceeds the specified limit, it is recommended that you install a heat exchanger in the board to lower the ambient temperature inside the board.

If a normal ventilating fan is used, dust will be sucked into the PLC together with the external air, and it may affect the performance of the PLC.

(7) Example of calculation of average power consumption

(a) System configuration

Q61P-A1	Q02HCPU	QX40	QX40	QY10	QJ71LP21	Vacant	Q35B
---------	---------	------	------	------	----------	--------	------

(b) 5 VDC current consumption of each module

Q02HCPU	: 0.64 (A)
QX40	: 0.05 (A)
QY10	: 0.43 (A)
QJ71LP21	: 0.55 (A)
Q35B	: 0.074 (A)

(c) Power consumption of power module

$$W_{PW} = 3/7 \times (0.64 + 0.05 + 0.05 + 0.43 + 0.55 + 0.074) \times 5 = 3.84 \text{ (W)}$$

(d) Power consumption of a total of 5 VDC logic section of each module

$$W_{5V} = (0.64 + 0.05 + 0.05 + 0.43 + 0.55 + 0.074) \times 5 = 8.97 \text{ (W)}$$

(e) A total of 24 VDC average power consumption of the output module

$$W_{24V} = 0 \text{ (W)}$$

- (f) Average power consumption due to voltage drop in the output section of the output module

$$W_{OUT} = 0 \text{ (W)}$$

- (g) Average power consumption of the input section of the input module

$$W_{IN} = 0.004 \times 24 \times 32 \times 1 = 3.07 \text{ (W)}$$

- (h) Power consumption of the power supply section of the intelligent function module

$$W_s = 0 \text{ (W)}$$

- (i) Power consumption of overall system.

$$W = 3.84 + 8.97 + 0 + 0 + 3.07 + 0 = 15.88 \text{ (W)}$$

9.3 Module Installation

9.3.1 Precaution on installation

**CAUTION**

- Use the PLC in an environment that meets the general specifications contained in this manual. Using this PLC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Hold down the module loading lever at the module bottom, and securely insert the module fixing hook into the fixing hole in the base unit. Incorrect loading of the module can cause a malfunction, failure or drop. When using the PLC in the environment of much vibration, tighten the module with a screw.
Tighten the screw in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to damage to the screw or module.
- When installing more cables, be sure that the base unit and the module connectors are installed correctly. After installation, check them for looseness. Poor connections could cause an input or output failure.
- Securely load the memory card by pushing it into the memory card loading slot. Make a check after loading. Not doing so can cause a malfunction due to a contact fault.
- Completely turn off the external power supply before loading or unloading the module. Not doing so could result in electric shock or damage to the product.
- Do not directly touch the module's conductive parts or electronic components. Touching the conductive parts could cause an operation failure or give damage to the module.

This section gives instructions for handling the CPU, input/output, intelligent function and power supply modules, base units and so on.

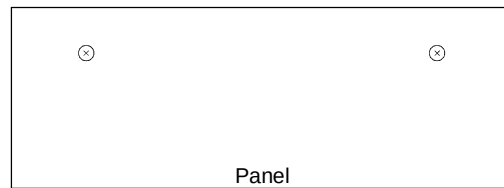
- (1) Module enclosure, terminal block connectors and pin connectors are made of resin; do not drop them or subject them to strong impact.
- (2) Do not remove modules' printed circuit boards from the enclosure in order to avoid changes in operation.
- (3) Tighten the module mounting screws and terminal block screws within the tightening torque range specified below.

Location of Screw	Tightening Torque Range
Module fixing screw (M3 × 12 screw)	36 to 48 N•cm
I/O module terminal block screw (M3 screw)	42 to 58 N•cm
I/O module terminal block fixing screw (M3 screw)	66 to 89 N•cm
Power module terminal screw (M3.5 screw)	59 to 88 N•cm

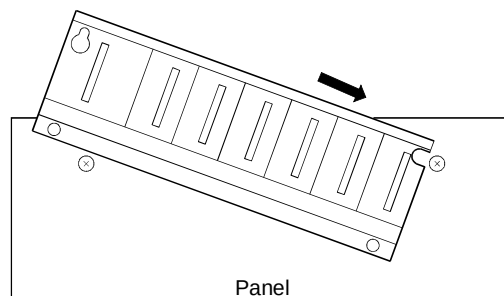
- (4) Be sure to install the power supply module in the Q3□B, Q6□B and QA1S6□B. Even if the power supply module is not installed, when the input/output modules and intelligent function module installed on the base units are of light load type, the modules may be operated. In this case, because a voltage becomes unstable, we cannot guarantee the operation.
- (5) When an extension cable is used, do not bind the cable together with the main circuit (high voltage, heavy current) line or lay them close to each other.

(6) Install the main base unit (by screwing) in the following procedure.

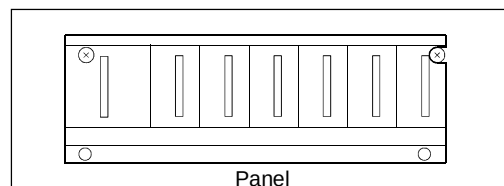
1) Fit the two base unit top fixing screws into the enclosure.



2) Place the right-hand side notch of the base unit onto the right-hand side screw.



3) Place the left-hand side pear-shaped hole onto the left-hand side screw.



4) Fit the fixing screws into the fixing screw holes in the base unit bottom and retighten the four fixing screws.

Note : Install the main base unit to a panel, with no module loaded in the rightmost slot.

Remove the base unit after unloading the module from the rightmost slot.

(7) Note the following points when mounting a DIN rail.

Mounting a DIN rail needs special adaptors (optional), which are to be user-prepared.

(a) Applicable adaptor types

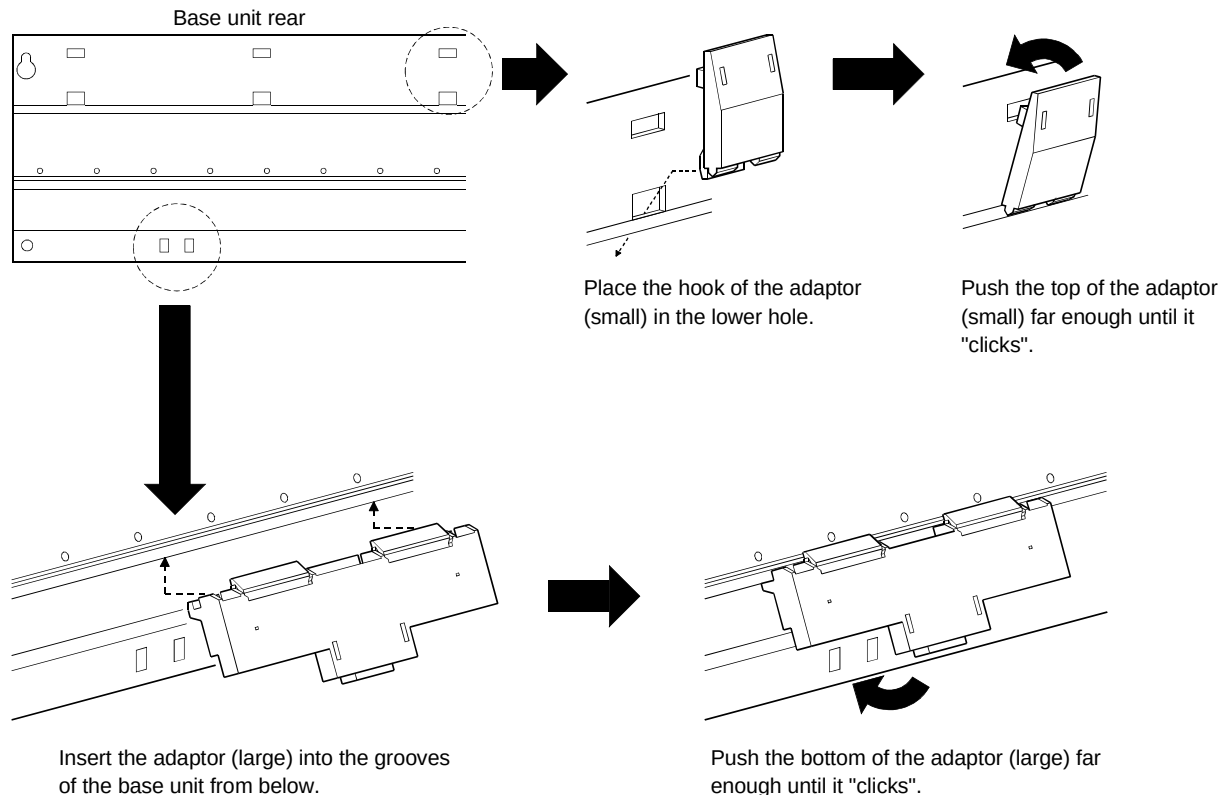
For Q38B, Q312B, Q68B, Q612B : Q6DIN1

For Q35B, Q65B : Q6DIN2

For Q33B, Q52B, Q55B, Q63B : Q6DIN3

(b) Adaptor installation method

The way to install the adaptors for mounting a DIN rail to the base unit is given below.



(c) Applicable DIN rail types (JIS C 2812)

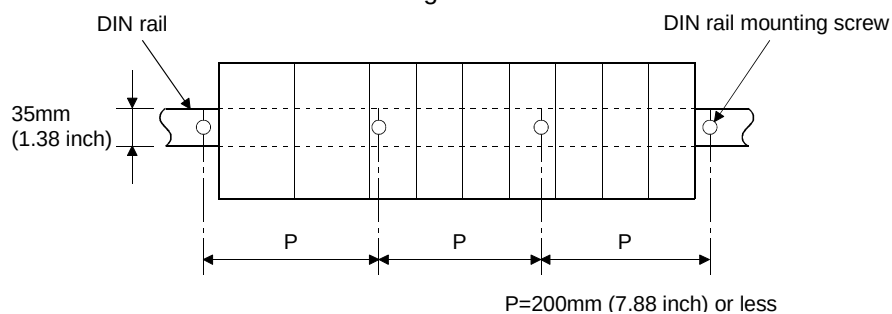
TH35-7.5Fe

TH35-7.5Al

TH35-15Fe

(d) DIN rail mounting screw intervals

When using a TH35-7.5Fe or TH35-7.5Al DIN rail, rail mounting screws should be tightened at a pitch of 200 mm (7.88 inch) or less in order to ensure that the rail has sufficient strength.

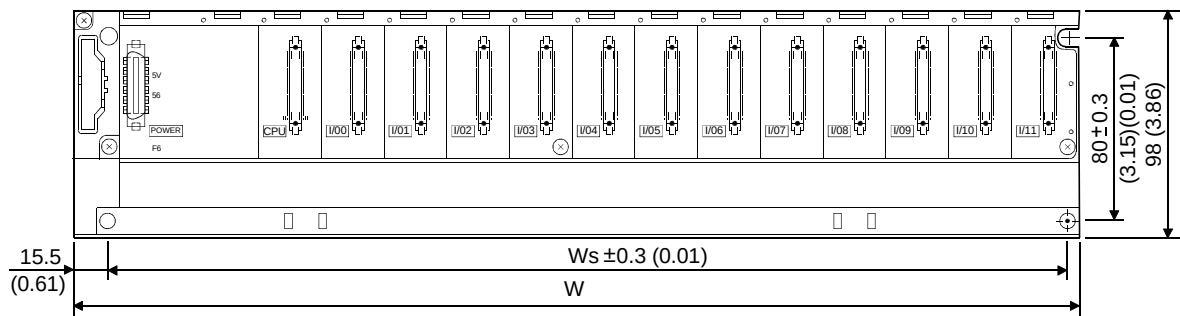


9.3.2 Instructions for mounting the base unit

When mounting the PLC to an enclosure or the like, fully consider its operability, maintainability and environmental resistance.

(1) Mounting dimensions

Mounting dimensions of each base unit are as follows:

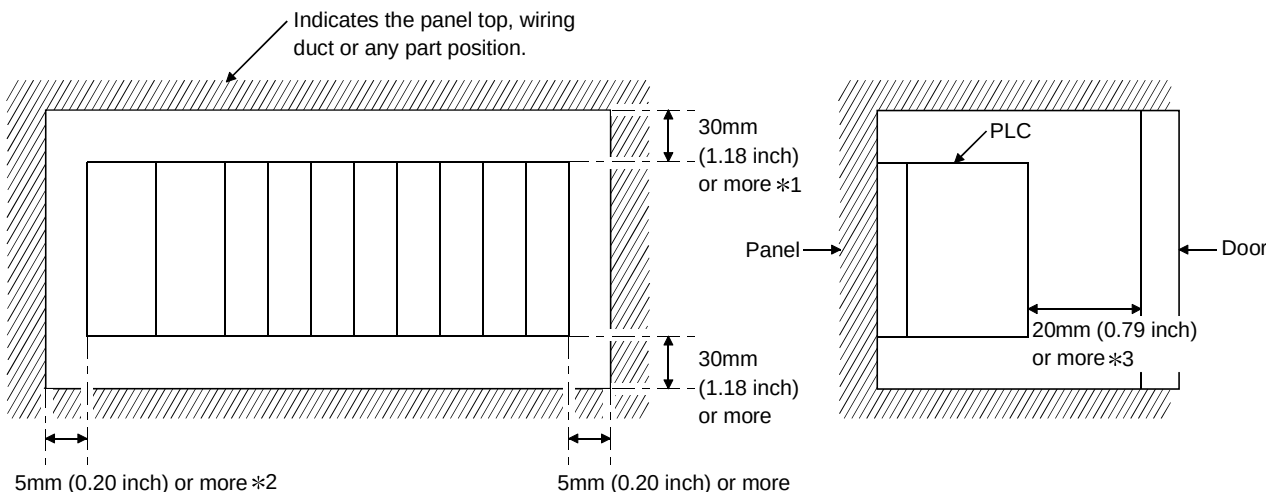


	Q33B	Q35B	Q38B	Q312B	Q52B	Q55B	Q63B	Q65B	Q68B	Q612B	QA1S65B	QA1S68B
W	189 (7.43)	245 (9.65)	328 (12.92)	439 (17.30)	106 (4.17)	189 (7.43)	189 (7.43)	245 (9.65)	328 (12.92)	439 (17.30)	315 (12.41)	420 (16.55)
Ws	167 (6.57)	224.5 (8.85)	308 (12.14)	419 (16.51)	83.5 (3.28)	167 (6.57)	167 (6.57)	222.5 (8.77)	306 (12.06)	417 (16.43)	295 (11.62)	400 (15.76)
H	98 (3.86)										130 (5.12)	
Hs	80 (3.15)										110 (4.33)	

Unit: mm (inch)

(2) Module mounting position

For enhanced ventilation and ease of module replacement, leave the following clearances between the module top/bottom and structure/parts.



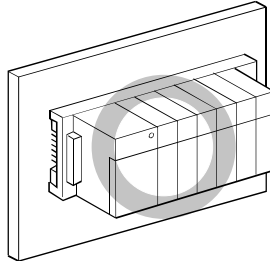
*1 : For wiring duct (50mm (1.97 inch) or less height).
40mm (1.58 inch) or more for other cases.

*2 : 5mm (0.20 inch) or more when the adjacent module is removed and the extension cable is connected.

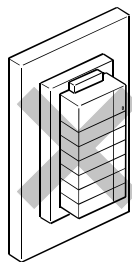
*3 : 80mm (3.15 inch) or more for the connector type.

(3) Module mounting orientation

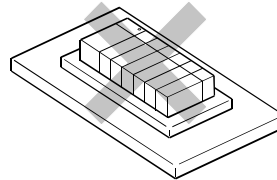
- (a) Since the PLC generates heat, it should be mounted on a well ventilated location in the orientation shown below.



- (b) Do not mount it in either of the orientations shown below.



Vertical



Flat

(4) Installation surface

Mount the base unit on a flat surface. If the mounting surface is not even, this may strain the printed circuit boards and cause malfunctions.

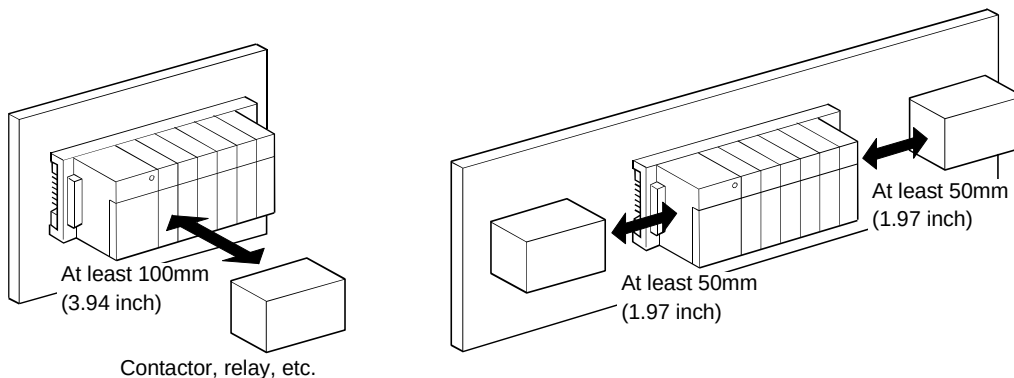
(5) Installation of unit in an area where the other devices are installed

Avoid mounting base unit in proximity to vibration sources such as large magnetic contractors and no-fuse circuit breakers; mount these on a separate panel or at a distance.

(6) Distances from the other devices

In order to avoid the effects of radiated noise and heat, provide the clearances indicated below between the PLC and devices that generate noise or heat (contactors and relays).

- Required clearance in front of PLC : at least 100 mm (3.94 inch)
- Required clearance on the right and left of PLC : at least 50 mm (1.97 inch)



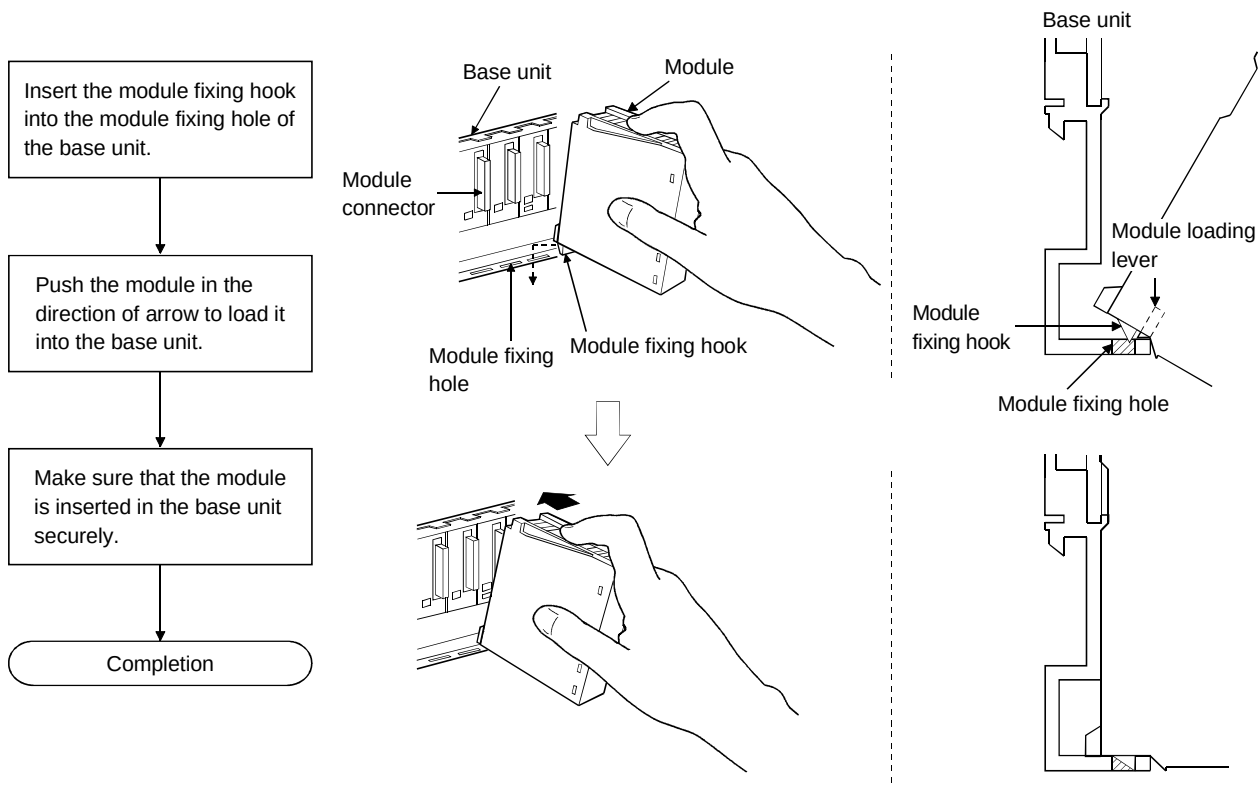
9.3.3 Installation and removal of module

This section explains how to install and remove a power supply, CPU, I/O, intelligent function or another module to and from the base unit.

(1) Installation and removal of the module from Q3□B, Q5□B and Q6□B

The installation and removal of the module from Q3□B/Q6□B base unit are described below.

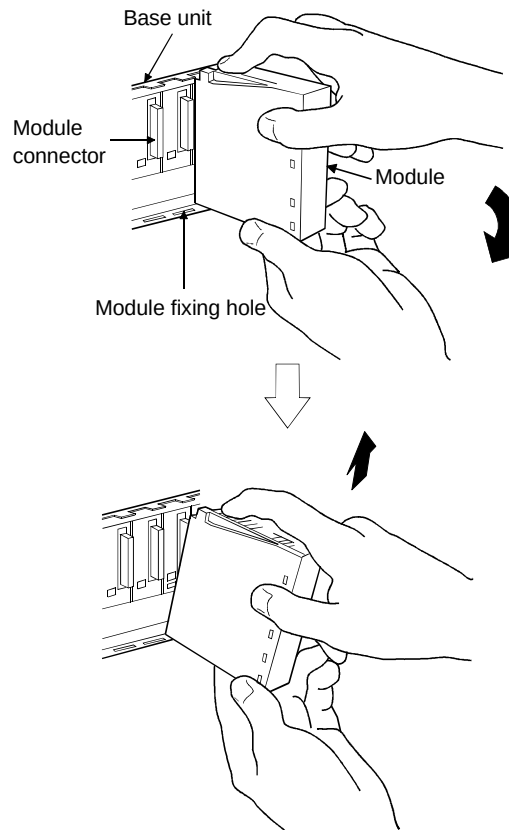
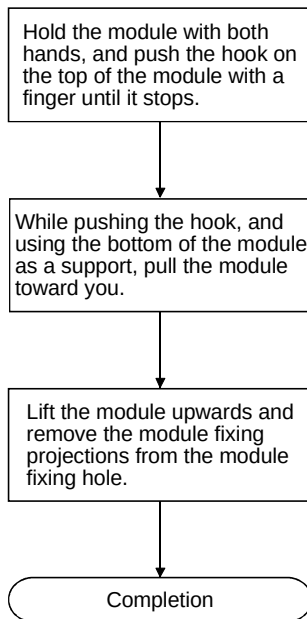
(a) Installation of module on Q3□B, Q5□B and Q6□B



POINTS

- (1) Always insert the module fixing hook of the module into the module fixing hole.
Forcing the hook into the hole will damage the module connector and module.
- (2) When using the PLC in a place where there is large vibration or impact, screw the CPU module to the base unit.
Module fixing screw : M3 × 12 (user-prepared)

(b) Removal from Q3□B, Q5□B and Q6□B

**POINT**

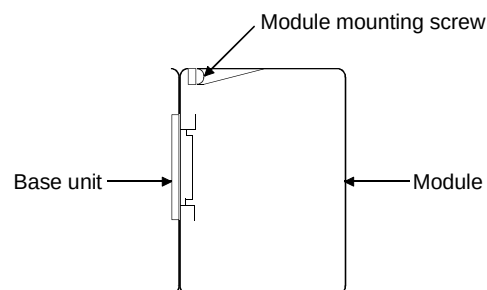
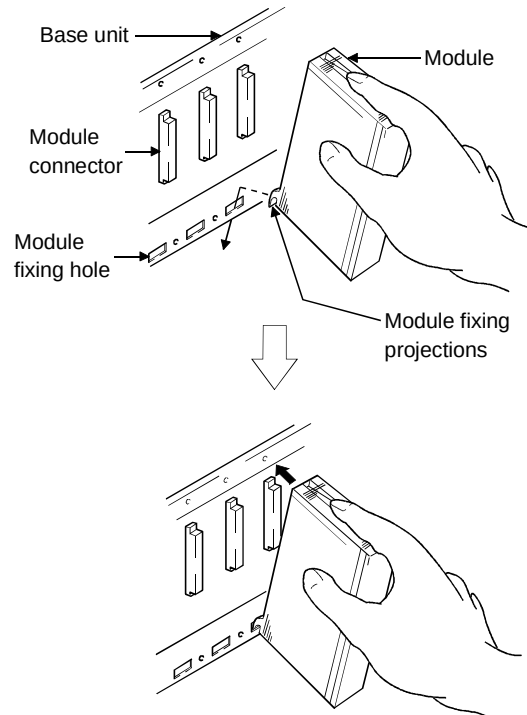
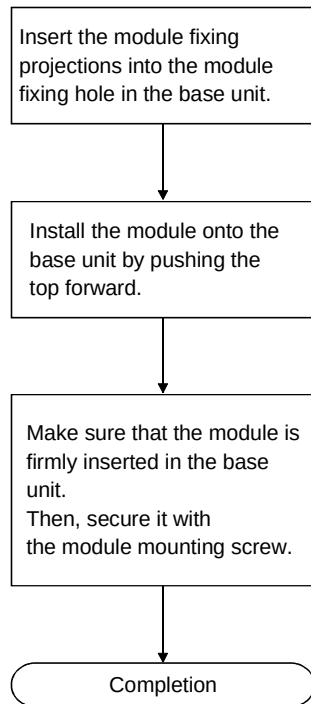
When the module fixing screw is used, always remove the module by removing the module fixing screw and then taking the module fixing hook off the module fixing hole of the base unit.

Forcibly removing the module will damage the module.

(2) Installation and removal of the module from QA1S6□B

The procedure for installing and removing the module from the QA1S6□B base unit is described below.

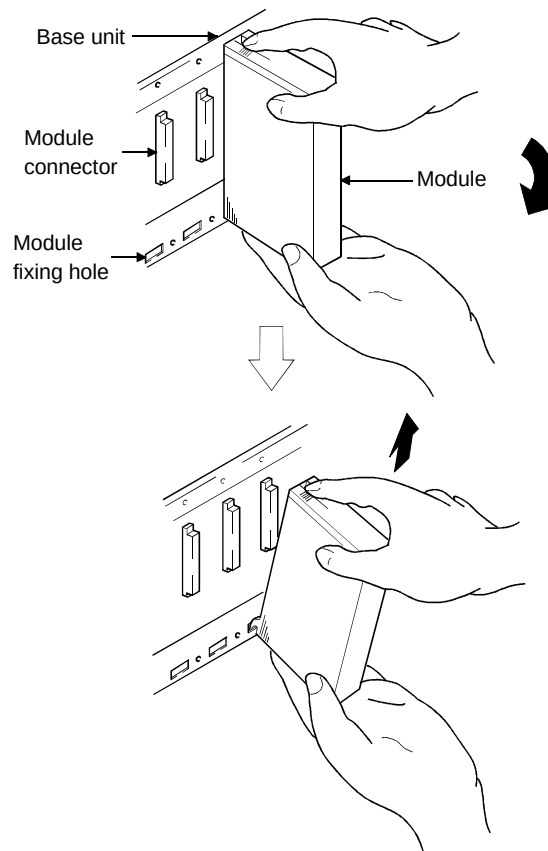
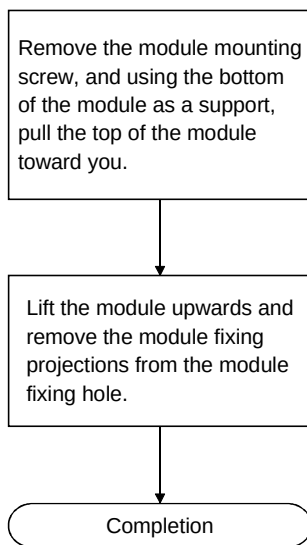
(a) Installation of module on QA1S6□B

**POINT**

Make sure to install the module, with the module fixing projection inserted into the module fixing hole, with the module fixing screws.

If it is installed forcibly without inserting the projection into the hole, the module connector and module may be damaged.

(b) Removal from QA1S6□B

**POINT**

To remove the module, make sure to remove the module fixing screws, and then disengage the module fixing projection from the module fixing hole. If it is removed forcibly without disengaging the projection from the hole, the module fixing projection may be damaged.

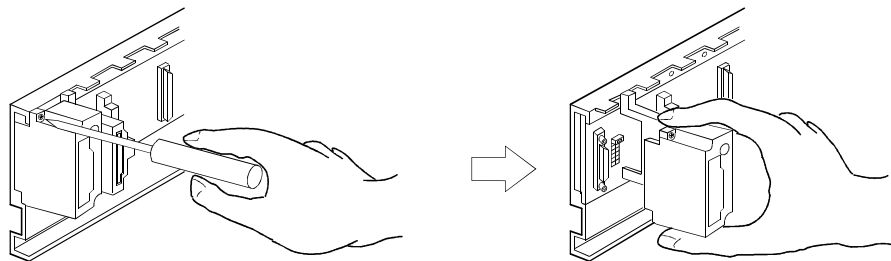
9.4 How to Set Stage Numbers for the Extension Base Unit

When using two or more extension base units, their stage numbers must be set with their stage number setting connectors. Extension 1 need not be set since the extension number is factory-set to 1.

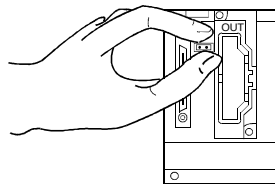
Make this setting in the following procedure.

- (1) The stage number setting connector of the extension base unit is located under the IN side base cover. (Refer to Section 6.4 for the setting of the extension number setting connector.)

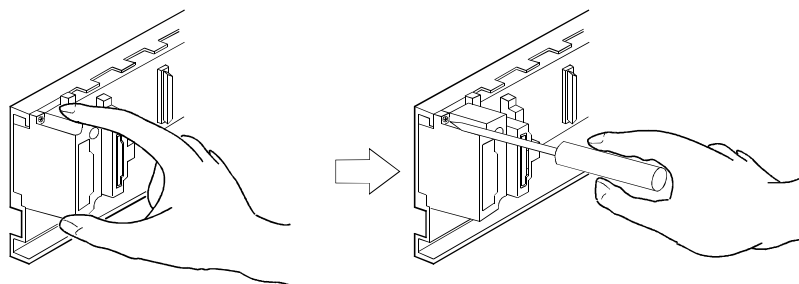
First, loosen the upper and lower screws in the IN side base cover and remove the base cover from the extension base unit.



- (2) Insert the connector pin in the required stage number location of the connector (PIN1) existing between the IN and OUT sides of the extension cable connector.



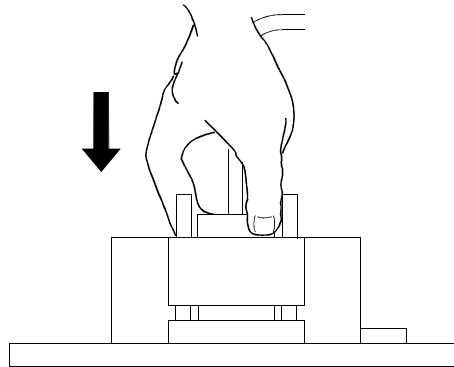
- (3) Install the base cover to the extension base unit and tighten the base cover screw. (Tightening torque: 36 to 48N • cm)



9.5 Connection and Disconnection of Extension Cable

(1) Instructions for handling an extension cable

- Do not stamp an extension cable.
- An extension cable must be connected to the base unit when the base cover has been installed.
(After you have set the extension number to the extension base unit, reinstall and screw the base cover.)
- When running an extension cable, the minimum bending radius of the cable should be 55mm (2.17 inch) or more.
If it is less than 55mm (2.17 inch), a malfunction may occur due to characteristic deterioration, open cable or the like.
- When connecting or disconnecting an extension cable, do not hold the ferrite cores mounted at both ends of the cable.
Hold the connector part of the cable for connection or disconnection.



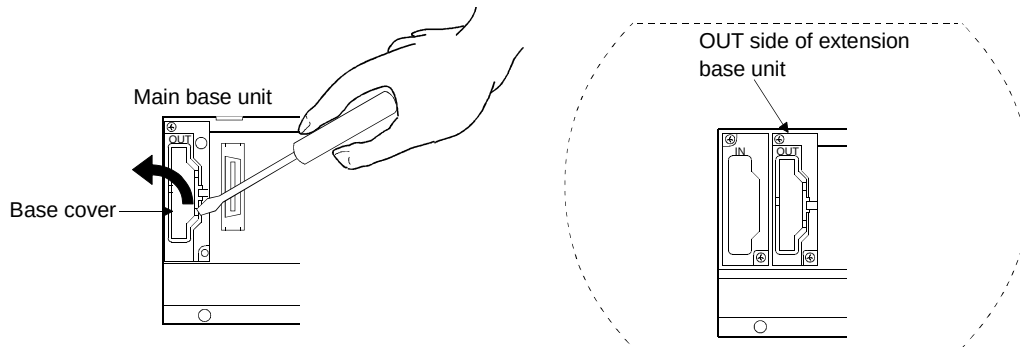
Holding the ferrite core may cause the cable to open within the connector. Also, if the ferrite core is shifted, the characteristic will change. When handling the cable, take care not to shift the ferrite core positions.

(2) Connection of extension cable

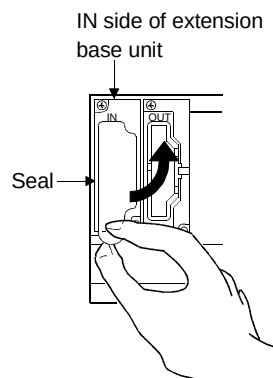
POINT	
	When connecting an extension base unit to the main base unit with an extension cable, always plug the OUT side connector of the main base unit and the IN side connector of the extension base unit with an extension cable. The system will not operate properly if the extension cable is connected in the form of IN to IN, OUT to OUT or OUT to IN. When connecting two or more extension base units, plug the OUT side connector of the first extension base unit and the IN side connector of the second extension base unit with an extension cable.

- (a) To connect an extension cable to the main base unit, remove the portion under the OUT characters on the base cover with a tool such as a flat-blade screwdriver (5.5×75 , 6×100).

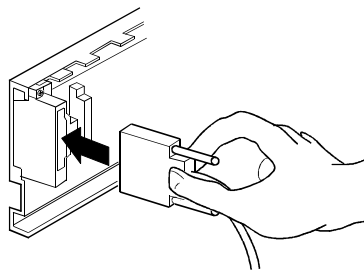
This also applies to a case where an extension cable is connected to the OUT side connector of the extension base unit.



- (b) To connect the extension cable to the next extension base unit, remove the seal applied under the IN characters on the base cover.

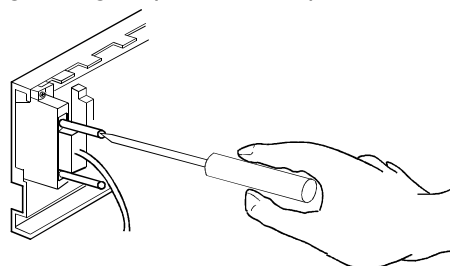


- (c) When plugging the extension cable to any base unit, hold the connector part of the extension cable.



- (d) After fitting the extension cable, always tighten the extension cable connector fixing screws.

(Tightening torque: $20\text{N} \cdot \text{cm}$)



(3) Disconnection of extension cable

When unplugging the extension cable, hold and pull the connector part of the extension cable after making sure that the fixing screws have been removed completely.

9.6 Wiring

9.6.1 The precautions on the wiring

⚠ DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

⚠ CAUTION

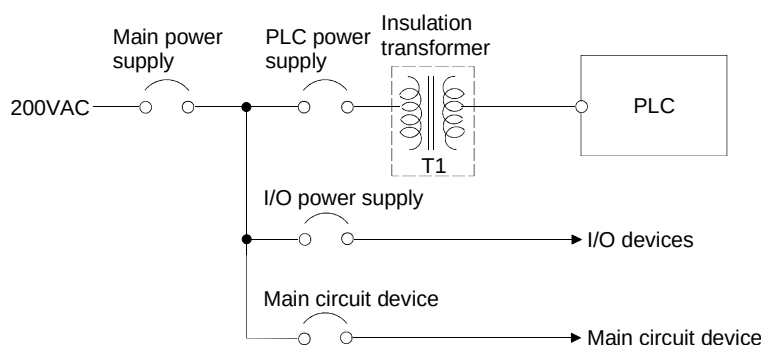
- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PLC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. Imperfect connections could result in short circuit, fires, or erroneous operation.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation. Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- The module has an ingress prevention label on its top to prevent foreign matter, such as wire offcuts, from entering the module during wiring.
Do not peel this label during wiring.
Before starting system operation, be sure to peel this label because of heat dissipation.

The precautions on the connection of the power cables are described below.

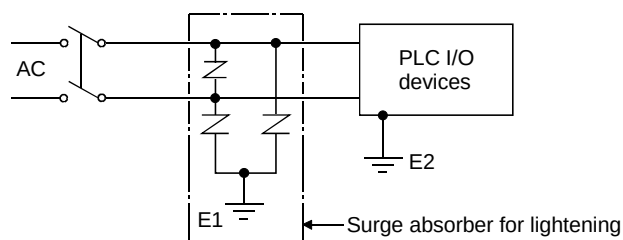
(1) Power supply wiring

- (a) Separate the PLC's power supply line from the lines for I/O devices and power devices as shown below.

When there is much noise, connect an insulation transformer.



- (b) 100VAC, 200VAC and 24VDC wires should be twisted as dense as possible. Connect the modules with the shortest distance. Also, to reduce the voltage drop to the minimum, use the thickest wires possible (maximum 2mm²).
- (c) Do not bundle the 100VAC and 24VDC wires with, or run them close to, the main circuit (high voltage, large current) and I/O signal lines. If possible, run them more than 100mm (3.94 inch) away.
- (d) As a countermeasure to power surge due to lightening, connect a surge absorber for lightening as shown below.

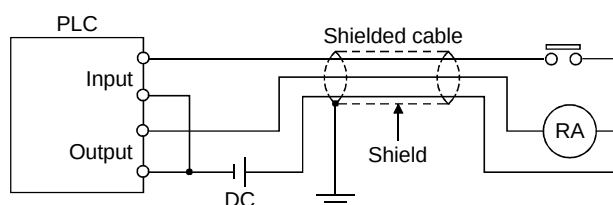


POINT

- | |
|--|
| <p>(1) Separate the ground of the surge absorber for lightening (E1) from that of the PLC (E2).</p> <p>(2) Select a surge absorber for lightening whose power supply voltage does not exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.</p> |
|--|

(2) Wiring of I/O equipment

- (a) Insulation-sleeved crimping terminals cannot be used with the terminal block. It is recommended to cover the wire connections of the crimping terminals with mark or insulation tubes.
- (b) The wires used for connection to the terminal block should be 0.3 to 0.75mm² in core and 2.8mm (0.11 inch) max. in outside diameter.
- (c) Run the input and output lines away from each other.
- (d) When the wiring cannot be run away from the main circuit and power lines, use a batch-shielded cable and ground it on the PLC side. In some cases, ground it in the opposite side.

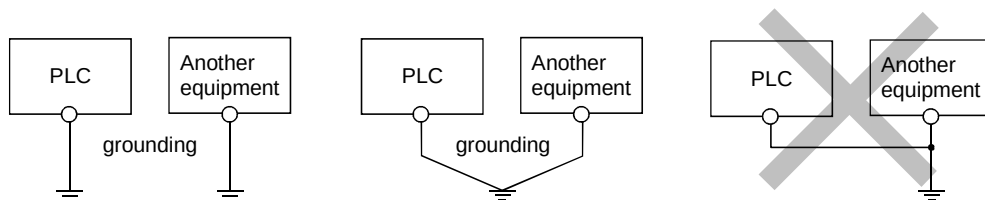


- (e) Where wiring runs through piping, ground the piping without fail.
- (f) Run the 24VDC input line away from the 100VAC and 200VAC lines.
- (g) Wiring of 200m (686.67 feet) or longer distance will give rise to leakage currents due to the line capacity, resulting in a fault. Refer to Section 11.5 for details.

(3) Grounding

To ground the cable, follow the steps (a) to (c) shown below.

- (a) Use the dedicated grounding as far as possible.
- (b) When a dedicated grounding cannot be performed, use (2) Common Grounding shown below.

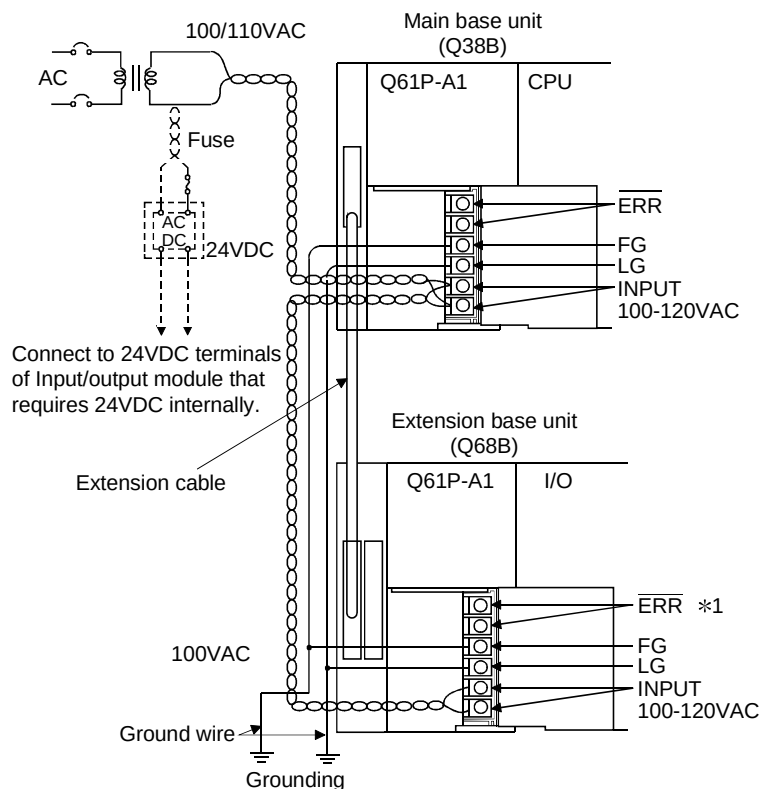


(1) Independent grounding.....Best (2) Common grounding.....Good (3) Joint grounding.....Not allowed

- (c) For grounding a cable, use the cable of 2 mm² or more. Position the ground-contact point as closely to the sequencer as possible, and reduce the length of the grounding cable as much as possible.

9.6.2 Connecting to the power supply module

The following diagram shows the wiring example of power lines, grounding lines, etc. to the main and extension base units.



POINTS

- (1) Use the thickest possible (max. 2 mm² (14 AWG)) wires for the 100 V/200 V and 24 VDC power cables. Be sure to twist these wires starting at the connection terminals. To prevent a short-circuit should any screws loosen, use solderless terminals with insulation sleeves.
- (2) When the LG terminals and FG terminals are connected, be sure to ground the wires. Do not connect the LG terminals and FG terminals to anything other than ground. If LG terminals and FG terminals are connected without grounding the wires, the PLC may be susceptible to noise. In addition, since the LG terminals have potential, the operator may receive an electric shock when touching metal parts.
- (3) *1 An error cannot be output from the ERR terminal of the power supply module loaded on the extension base. To output an error, use the ERR terminal of the power supply module loaded on the main base.

10. MAINTENANCE AND INSPECTION

**DANGER**

- Do not touch the terminals while power is on.
Doing so could cause shock.
- Correctly connect the battery. Also, do not charge, disassemble, heat, place in fire, short circuit, or solder the battery.
Mishandling of a battery can cause overheating or cracks which could result in injury and fires.
- Turn the power off when cleaning the module or tightening the terminal screws or module mounting screws.
Conducting these operations when the power is on could result in electric shock.
Loose terminal screws may cause short circuits or malfunctions.
Failure to mount the module properly will result in short circuit, malfunction or in the module falling.

**CAUTION**

- In order to ensure safe operation, read the manual carefully to acquaint yourself with procedures for program change, forced outputs, RUN, STOP, and PAUSE operations, etc., while operation is in progress.
Operation mistakes could cause damage to the equipment and other problems.
- Never try to disassemble or modify module. It may cause product failure, malfunction, fire or cause injury.
- When using any radio communication device such as a cellular phone or a PHS phone, keep them away from the controller at least 25 cm (9.85 inch) or it may cause a malfunction.
- Turn the power off when installing or removing the modules.
Trying to install or remove the module while the power is on could damage the module or result in erroneous operation.

In order that you can use the PLC in normal and optimal condition at all times, this section describes those items that must be maintained or inspected daily or at regular intervals.

10.1 Daily Inspection

The items that must be inspected daily are listed below.

Daily inspection

Item	Inspection Item		Inspection	Judgment Criteria	Remedy
1	Installation of base unit		Check that fixing screws are not loose and the cover is not dislocated.	The screws and cover must be installed securely.	Further tighten the screws.
2	Installation of I/O module		Check that the module is not dislocated and the hook is engaged securely.	The hook must be engaged and installed securely.	Securely engaged the hook.
3	Connection		Proximity of solderless terminals to each other	Terminal screws must not be loose.	Further tighten terminal screws.
			Connectors of extension cable	The connectors of extension cables must be positioned at proper intervals.	Correct the intervals.
			Check for lightening.	The connector must not be loose.	Further tighten connector fixing screws.
4	Module indication lamp	Power supply [POWER] LED	Check that it is lit.	The lamp must be lit. (Abnormal if the lamp goes off.)	Follow Section 10.2.
		CPU [RUN] LED	Check that the lamp lights up in RUN state.	The lamp must be lit. (Abnormal if the lamp goes off.)	
		CPU [ERR.] LED	Check that the lamp goes off.	The lamp must go off. Abnormal if the lamp lights up or flashes.	
		CPU [BAT. ARM] LED	Check that the lamp goes off.	The lamp must go off. (Abnormal if the lamp lights up.)	
		Input LED	Check that the lamp lights up and goes off.	The lamp must be lit when the input power is turned ON. The lamp must be extinguished when the input power is turned OFF. (Abnormal if the lamp does not light up or goes off as indicated above.)	
		Output LED	Check that the lamp lights up and goes off.	The lamp lights up when the output power is turned ON. The lamp must be extinguished when the output power is turned OFF. (Abnormal if the lamp does not light up or goes off as indicated above.)	

10.2 Periodic Inspection

The items that must be inspected one or two times every 6 months to 1 year are listed below.

When the equipment is moved or modified, or layout of the wiring is changed, also perform this inspection.

Periodic Inspection

Item	Inspection Item		Inspection	Judgment Criteria	Remedy
1	Ambient environment	Ambient temperature	Measure with a thermometer and a hygrometer. Measure corrosive gas.	0 to 55 °C	When the sequencer is used in the board, the ambient temperature in the board becomes the ambient temperature.
		Ambient humidity		5 to 95 %RH	
		Atmosphere		Corrosive gas must not be present.	
2	Power voltage		Measure a voltage across the terminals of 100/200VAC and 24VDC.	85 to 132VAC 170 to 264VAC 15.6 to 31.2VDC	Change the power supply.
3	Installation	Looseness, rattling	Move the module to check for looseness and rattling.	The module must be installed fixedly.	Further tighten screws. If the CPU, input/output, or power supply module is loose, fix it with screws.
		Adhesion of dirt and foreign matter	Check visually.	Dirt and foreign matter must not be present.	Remove and clean.
4	Connection	Looseness of terminal screws	Try to further tighten screws with a screwdriver.	Screws must not be loose.	Further tighten.
		Proximity of solderless terminals to each other	Check visually.	Solderless terminals must be positioned at proper intervals.	Correct.
		Looseness of connectors	Check visually.	Connectors must not be loose.	Further tighten connector fixing screws.
5	Battery		check on the monitor mode of the GX Developer that SM51 or SM52 is turned OFF.	(Preventive maintenance)	Even if the lowering of a battery capacity is not shown, replace the battery with a new one if a specified service life of the battery is exceeded.

*1 When AnS Series Module is included in the system, the judgement criteria will be from 10 to 90 % RH.

10.3 Battery Replacement

When the voltage of the program and power interrupt hold-on function backup battery is lowered, the special relays SM51 and SM52 are energized.

Even if these special relays are energized, the contents of the program and power interrupt hold-on function are not erased immediately.

If the energization of these relays is recognized, however, these contents may be deleted unintentionally.

While a total of the power interrupt hold-on time after the SM51 is energized is within a specified time, replace the battery with a new one.

POINTS

The SM51 is used to give an alarm when the capacity of the battery is lowered.

Even after it is energized, the data is held for a specified time.

For safety, however, replace the battery with a new one as early as possible.

The SM52 is energized when the battery causes a complete discharge error.

Immediately after the relay has been energized, replace the battery with a new one.

Whichever voltage of the battery of the CPU module and SRAM card is lowered, the SM51 and SM52 are energized.

To identify the specific battery of the memory of which voltage is lowered, check the contents of the special registers SD51 and SD52.

When the voltage of the battery of each memory is lowered, the bit corresponding to each of SD51 and SD52 memories is turned on.

Bit No. of SD51 and SD52	Object
Bit 0	CPU module
Bit 1	SRAM card
Bit 2	Standard RAM

POINTS

The relation between the backups of the memories preformed by the batteries which are installed on the CPU module and SRAM card is described below.

The items that must be considered are the following two points.

1) The battery installed on the CPU module cannot backup the memory of the SRAM card.

2) The battery installed on the SRAM card cannot backup the memory of the CPU module.

Power supply Module	Battery of CPU Module	Battery of SRAM Card	Memory of CPU Module	Memory of SRAM Card
ON	Connection	ON	○	○
		OFF	○	○
	Unconnection	ON	○	○
		OFF	○	○
OFF	Connection	ON	○	○
		OFF	○	×
	Unconnection	ON	×	○
		OFF	×	×

○ : Backup enable × : Backup unable

The standard service life and replacement procedures of the battery is described on the next page.

10.3.1 Battery service life

(1) CPU module battery service life

The service life of the CPU module battery depends on the type of the CPU.

The battery service life corresponding to the type is shown below.

Battery service life Type of CPU	Battery service life (Total power interrupt time) [h]		
	Guaranteed value(MIN)	Value in actual use(TYP)	After SM51 is energized
Q02CPU	5433	13120	120
Q02HCPU,Q06HCPU	2341	6435	120
Q12HCPU,Q25HCPU	1260	4228	48

* The actual value in use means the averaged value, and the guaranteed value means the minimum value.

(2) SRAM card battery service life

The service life of the SRAM card battery is shown below.

Battery service life Type of battery		Battery service life (Total power interrupt time) [h]		
		Guaranteed value(MIN)	Value in actual use(TYP)	After SM51 is energized
Q2MEM-BAT	When stored	690	6336	8
	When used	11784	13872	8

* The value in actual use means the averaged value, and the guaranteed value means the minimum value.

"When stored" refers to the time the battery is consumed when the battery is connected to the CPU module and the power is turned OFF or when the SRAM card is independently stored.

"When used" refers to the time the battery is consumed when the battery is connected to the CPU module and the power is turned ON.

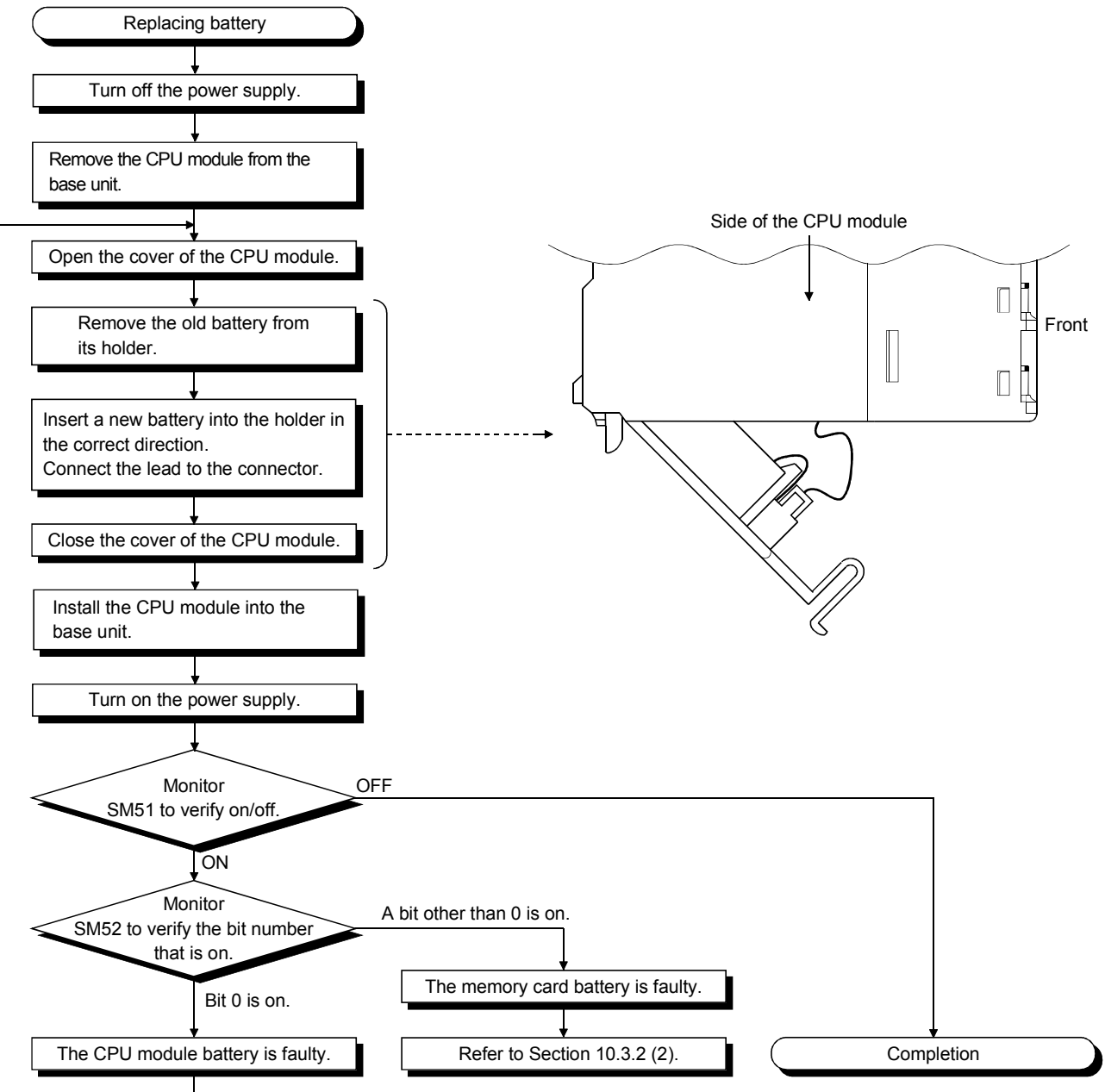
POINT	
Remember that the SRAM card consumes battery power even when the battery is connected to the CPU module and the power is turned ON.	

As a standard, when the power supply of the CPU module is turned on for 12 hours per day, the guaranteed service life of the SRAM card battery is approx. 1.1 years. The service life of the Q6BAT is 10 years when it is not connected to the CPU module or when it is connected to the CPU module and energized at all times. If a total of power interrupt time exceeds the guaranteed value specified above and the SM52 is turned on, replace the battery with a new one immediately.

10.3.2 Battery replacement procedure

- (1) CPU module battery replacement procedure
- When the CPU module battery has been exhausted, replace the battery with a new one in accordance with the procedure shown below. Before dismounting the battery, turn ON the power supply for 10 minutes or longer. Even when the battery is dismounted, the memories are backed up by the capacitor for a while. However, if the replacement time exceeds the guaranteed value specified in the table below, the contents stored in the memories may be erased. To prevent this trouble, replace the battery speedily.

Backup time by capacitor	
Backup time by capacitor[min]	
3	



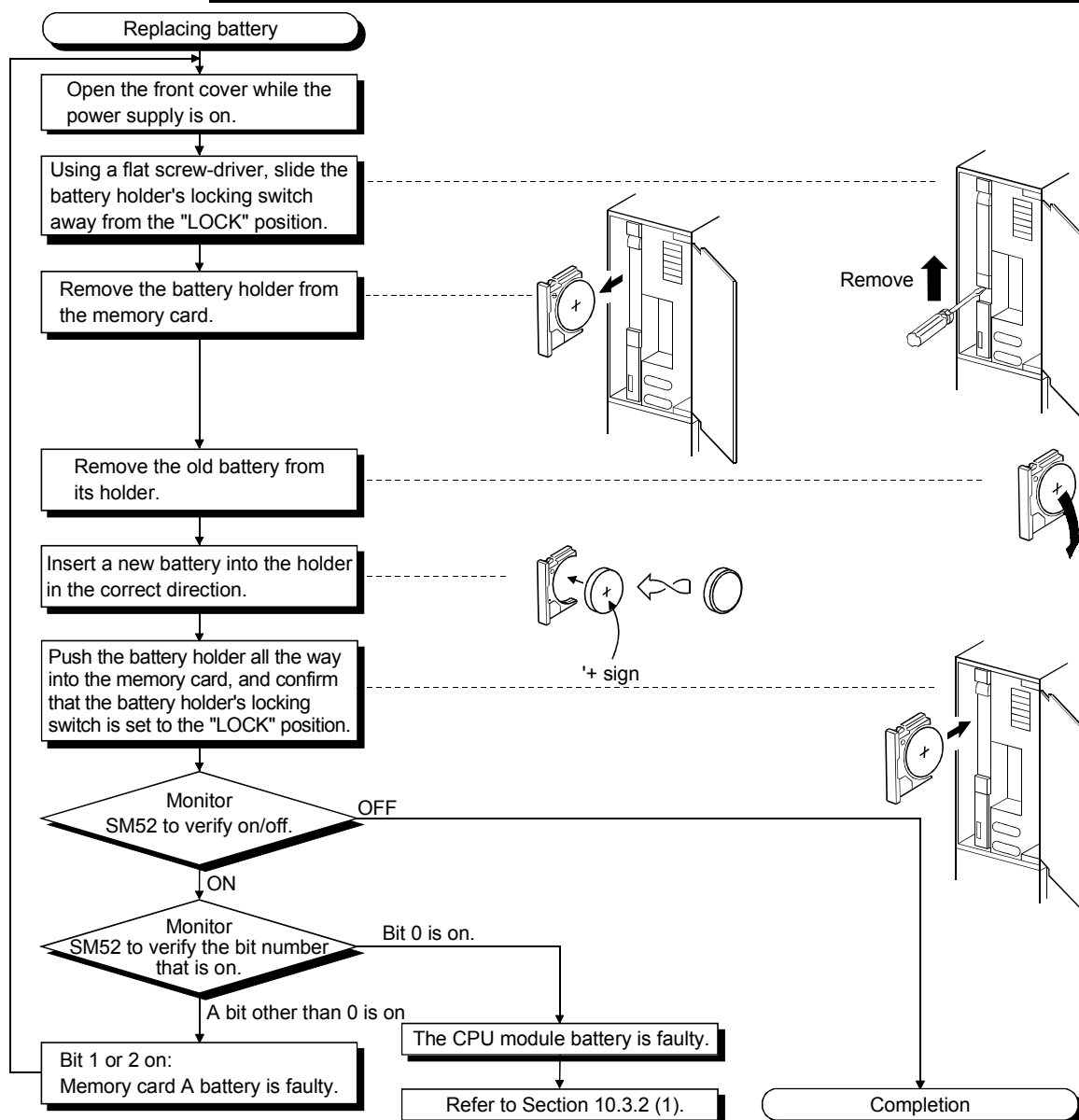
(2) SRAM card CPU module battery replacement procedure

When the SRAM card battery has been exhausted, replace the battery with a new one in accordance with the procedure shown below. When replacing the battery of the SRAM card, to hold the data, keep the SRAM card inserted into the energized CPU module.

POINTS

Replace the battery taking care of the following.

- (a) Start the replacement operation after backing up the data by the GX Developer.
- (b) Because the replacement operation must be performed while the power supply is turned on, perform the operation taking extreme care so that the electrification does not occur.
- (c) When dismantling or mounting the battery holder on the SRAM card, take care so that the battery does not come out of the battery holder.
- (d) When the sequencer is installed at a position from which it is difficult to dismantle the battery with the power turned on, it is recommended that you follow the steps below. First back up the data stored in the SRAM card by the GX Developer, and then replace the battery with a new one with the SRAM card removed from the CPU module. After inserting the SRAM card into the CPU module, write the data backed up from the GX Developer.



11. TROUBLESHOOTING

This section describes the various types of trouble that occur when the system is operated, and causes and remedies of these troubles.

11.1 Troubleshooting Basics

In order to increase the reliability of the system, not only highly reliable devices are used but also the speedy startup of the system after the occurrence of trouble becomes an important factor.

To start up the system speedily, the cause of the trouble must be located and eliminated correctly.

The basic three points that must be followed in the troubleshooting are as follows.

(1) Visual inspection

Visually check the following.

- 1) Movement of sequencer (stopped condition, operating condition)
- 2) Power supply on/off
- 3) State of input/output devices
- 4) Power supply module, CPU module, input/output module, intelligent function module, installation condition of extension cable
- 5) State of wiring (input/output cables, cables)
- 6) Display states of various types of indicators (POWER LED, RUN LED, ERR. LED, I/O LED)
- 7) States of setting of various types of set switches (Setting of No. of stages of extension base, power interrupt hold-on state)

After confirming items 1) to 7), connect the GX Developer, and check the operating conditions of the PLC and the contents of the program.

(2) Check of trouble

Check to see how the operating condition of the PLC varies while the PLC is operated as follows.

- 1) Set the RUN/STOP switch to STOP.
- 2) Reset the trouble with the RESET/L.CLR switch.
- 3) Turn ON and OFF the power supply.

(3) Reduction in area

Estimate the troubled part in accordance with items (1) and (2) above.

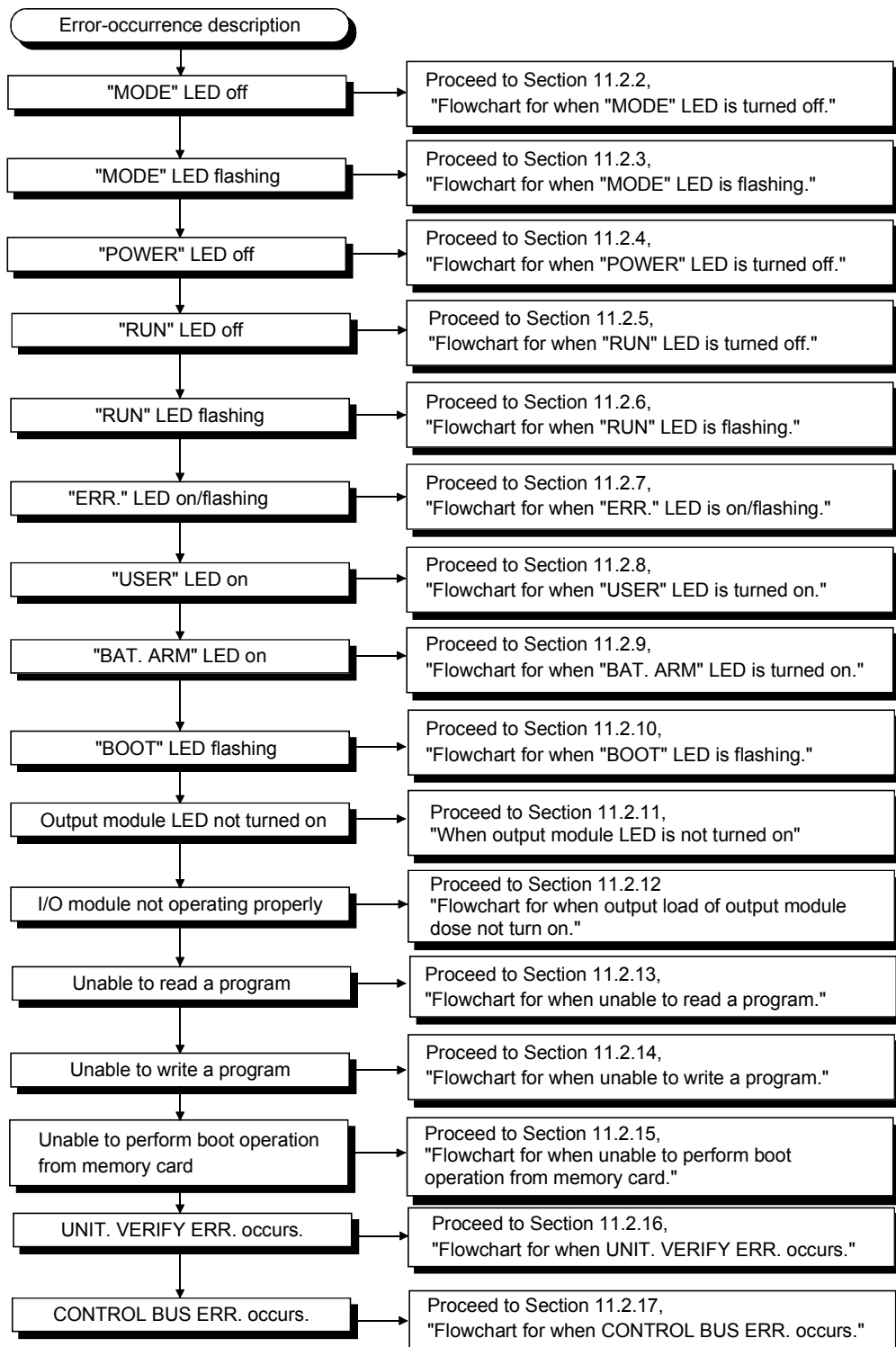
- 1) PLC or external devices
- 2) Input/output module or others
- 3) Sequence program

11.2 Troubleshooting

The trouble investigating methods, contents of troubles for the error codes, and remedies of the troubles are described below.

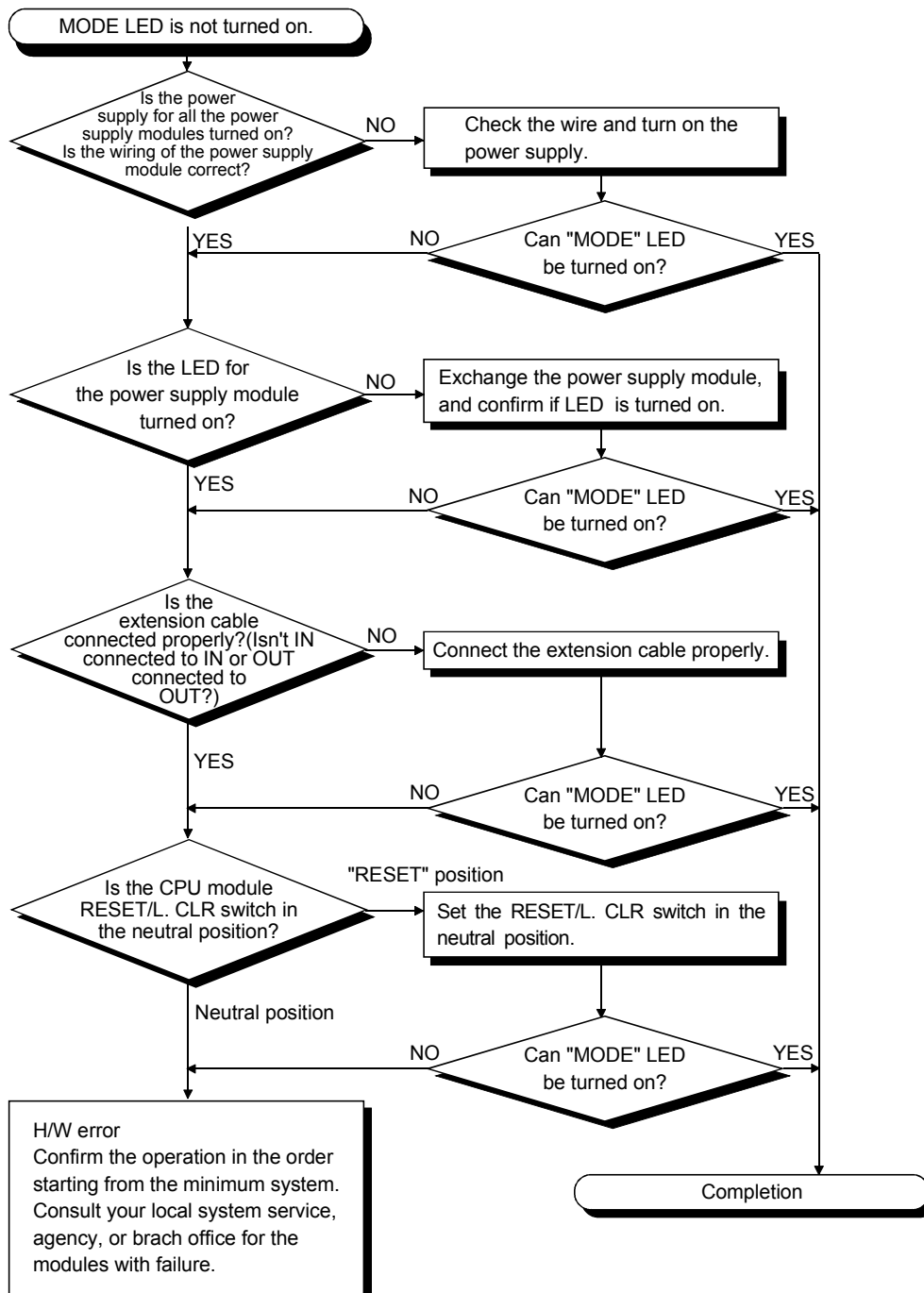
11.2.1 Troubleshooting flowchart

The following shows the contents of the troubles classified into a variety of groups according to the types of events.



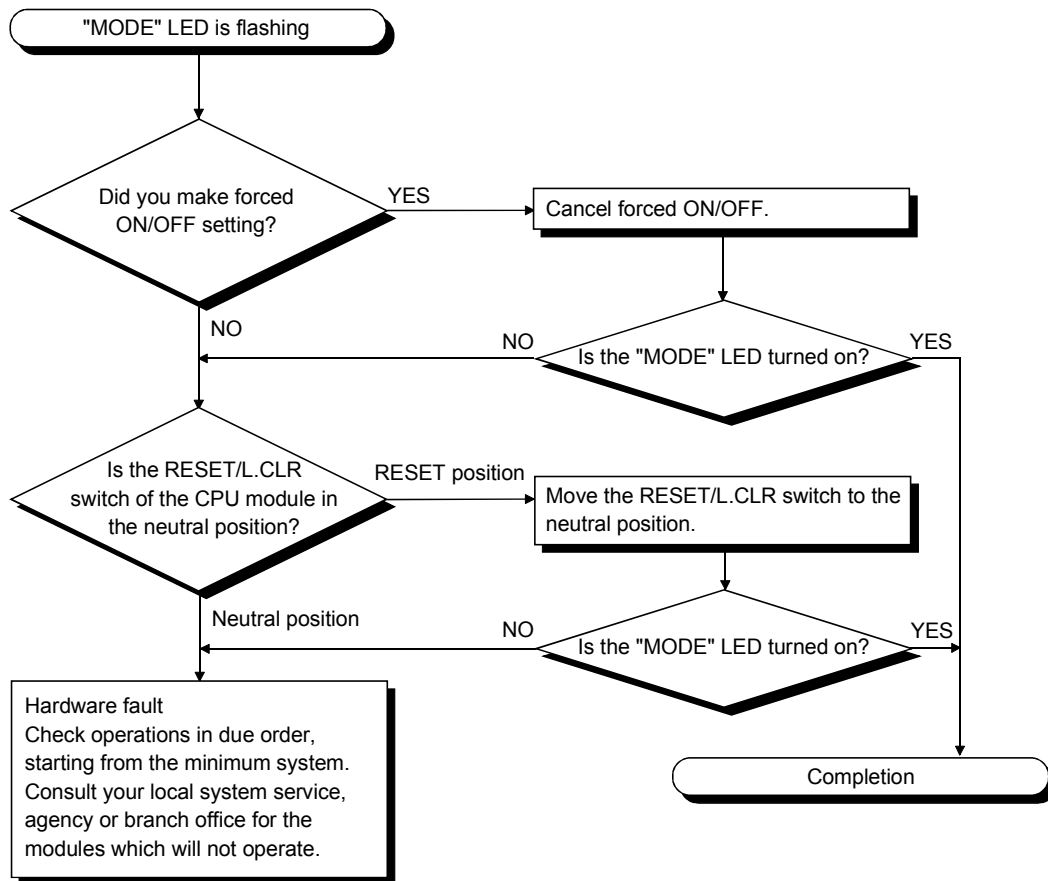
11.2.2 Flowchart for when "MODE" LED is not turned on

The following shows the flowchart to be followed when the "MODE" LED does not light up even when the power supply is turned on.



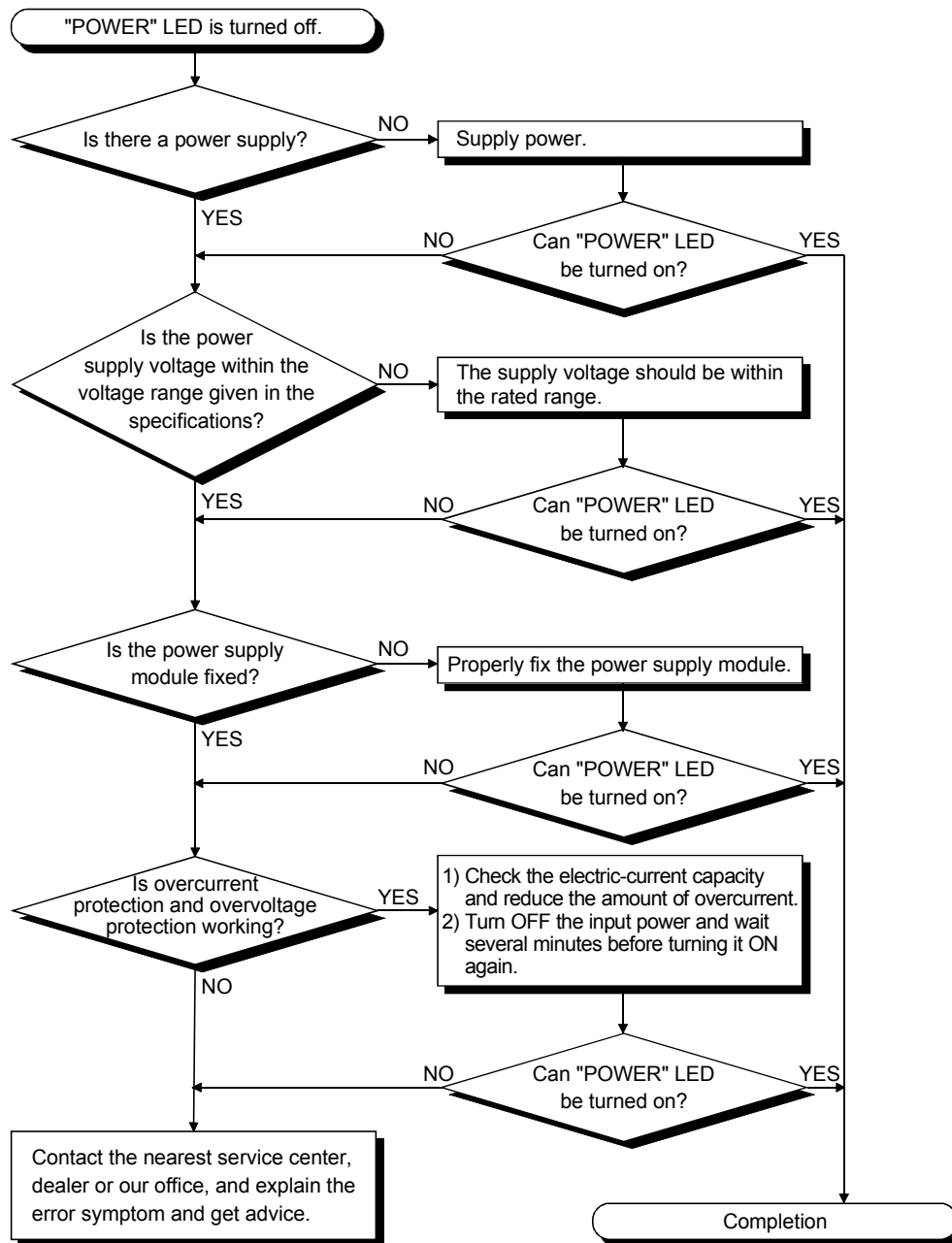
11.2.3 When "MODE" LED is flashing

The following shows the flowchart to be followed when the "MODE" LED flashes at power-on, operation start or during operation.



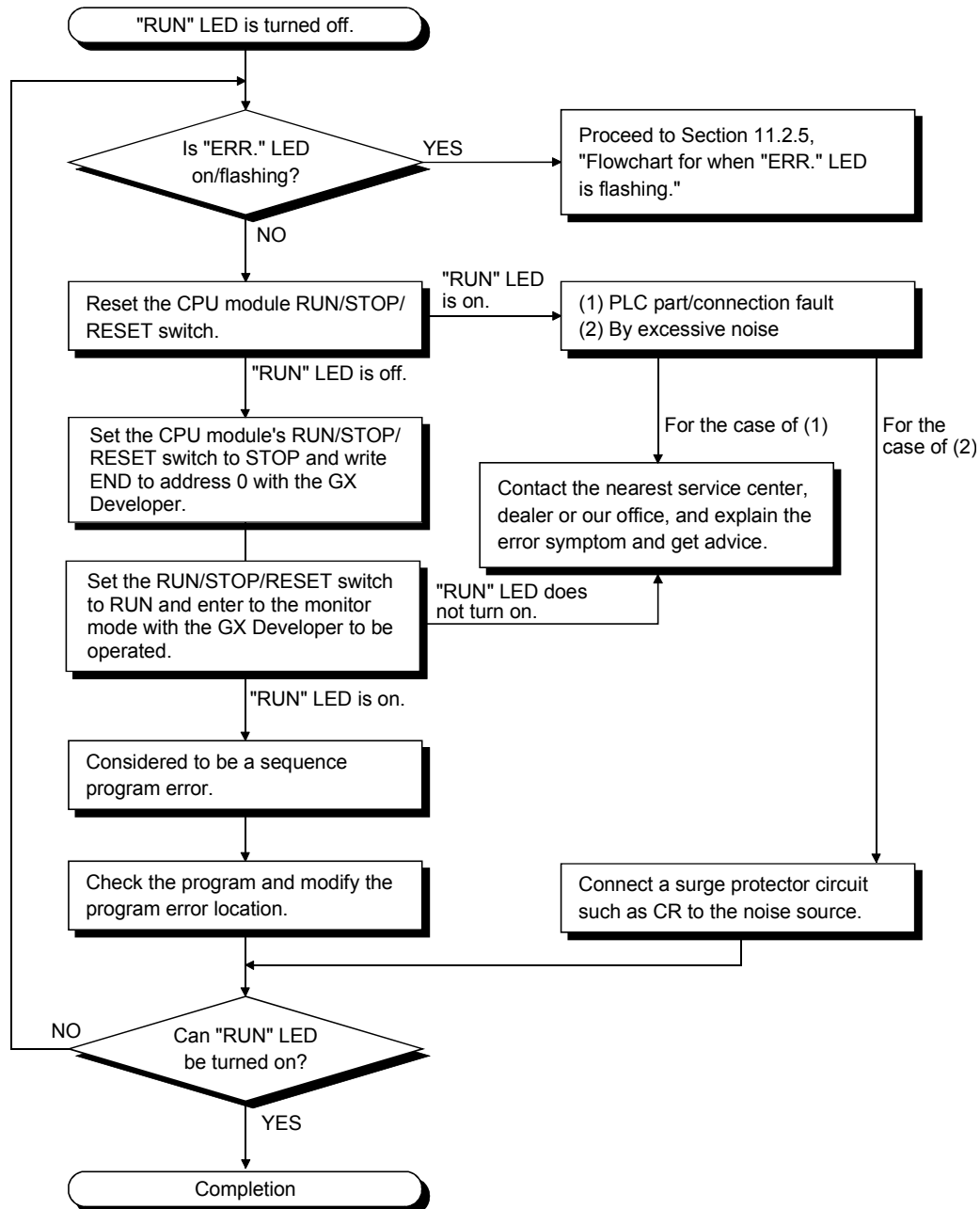
11.2.4 Flowchart for when "POWER" LED is turned off

The following shows the flowchart to be followed when the "POWER" LED goes off when the power supply is turned on or during the operation.



11.2.5 Flowchart for when the "RUN" LED is turned off

The following shows the flowchart to be followed when the "RUN" LED goes off during the operation.



11.2.6 When the "RUN" LED is flashing

If the "RUN" LED flashes, follow the steps below.

The High Performance model QCPU flashes the "RUN" LED when the RUN/STOP switch is set from STOP to RUN after the programs or parameters are written in the CPU module during the stoppage.

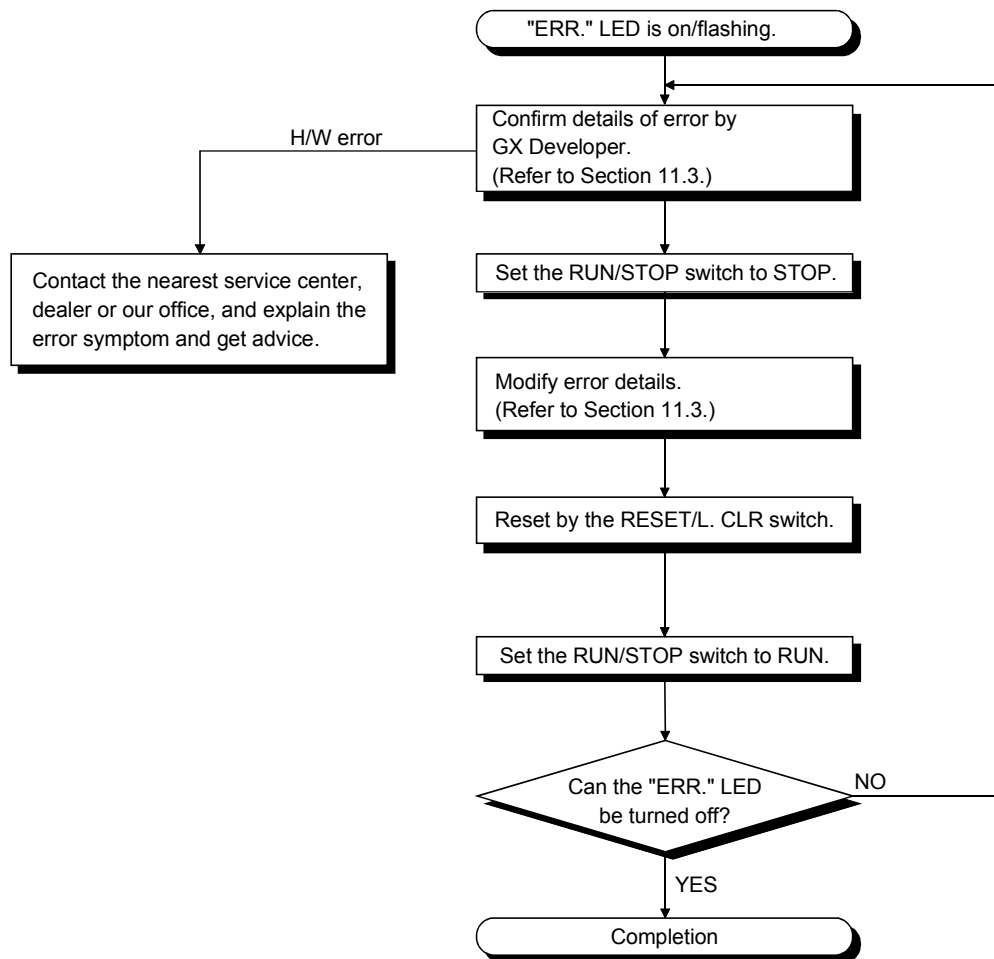
Though this is not the trouble with the CPU module, the operation of the CPU module is stopped.

To bring the CPU module into RUN state, reset the CPU module with the RESET/L.CLR or set the RUN/STOP switch again from STOP to RUN.

The "RUN" LED lights up.

11.2.7 Flowchart for when "ERR." LED is on/flashing

The following shows the flowchart to be followed when the "ERR." LED lights up/flashes during the operation when the power supply is turned on or the operation is started.



11.2.8 When "USER" LED is turned on

If the "USER" LED lights up, follow the steps shown below.

The High Performance model QCPU lights up the LED when an error is detected by the CHK instruction or the enunciator F is turned on.

If the LED is lit, monitor the special relays and special registers on the monitor mode of the GX Developer to check which of the CHK instruction and enunciator F is turned on (CHK instruction → SM80, SD80, Enunciator F → SM62, SD62 to SD79).

After confirmation, eliminate the cause of the lighting, and reset the QCPU with the RESET/L.CLR switch or run the LEDR instruction, and the "USER" LED will go off.

REMARK

When the RESET/L.CLR switch is tilted to L.CLR several times for latch clear operation, the 'USER' LED flashes to indicate that the latch clear processing is under operation.

When the RESET/L.CLR switch is further tilted to L.CLR while the 'USER' LED flashes, the 'USER' LED goes off and terminates the latch clear processing.

11.2.9 When "BAT.ARM" LED is turned on

If the "BAT.ARM" LED lights up, follow the steps shown below.

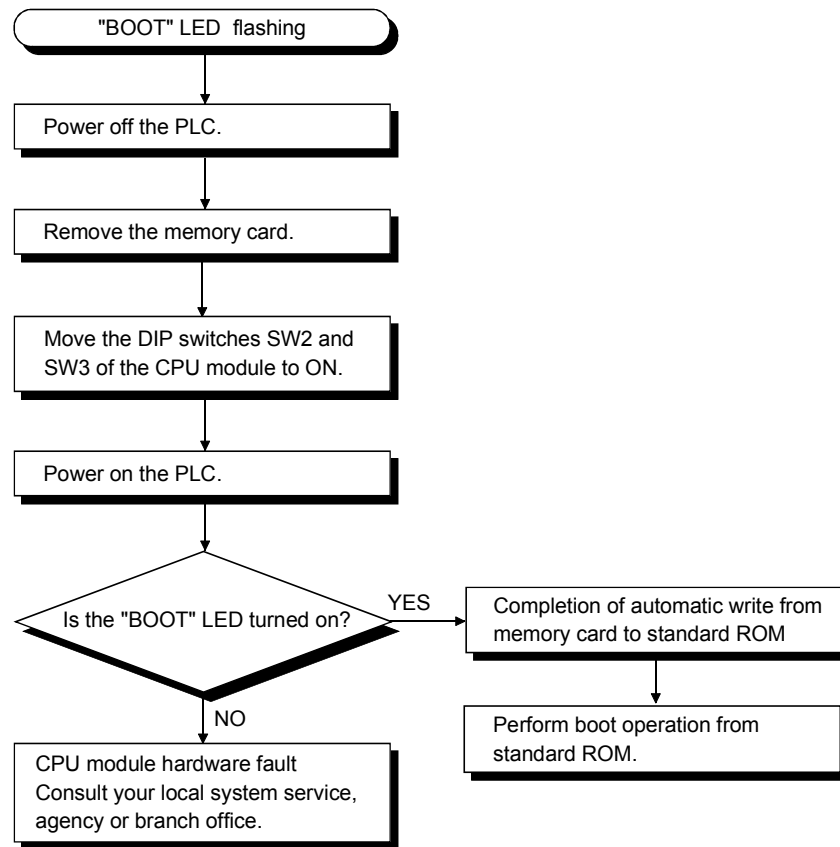
The High Performance model QCPU lights up the LED when the capacity of the battery is lowered.

If the LED lights up, monitor the special relays and special registers on the monitor mode of the GX Developer to check which of the batteries of the CPU module or SRAM card is lowered in capacity (SM51 to SM52, SD51 to SD52).

After confirmation, replace the battery with a new one, and reset the QCPU with the RESET/L.CLR switch or run the LEDR instruction, and the 'BAT.ARM' LED will go off.

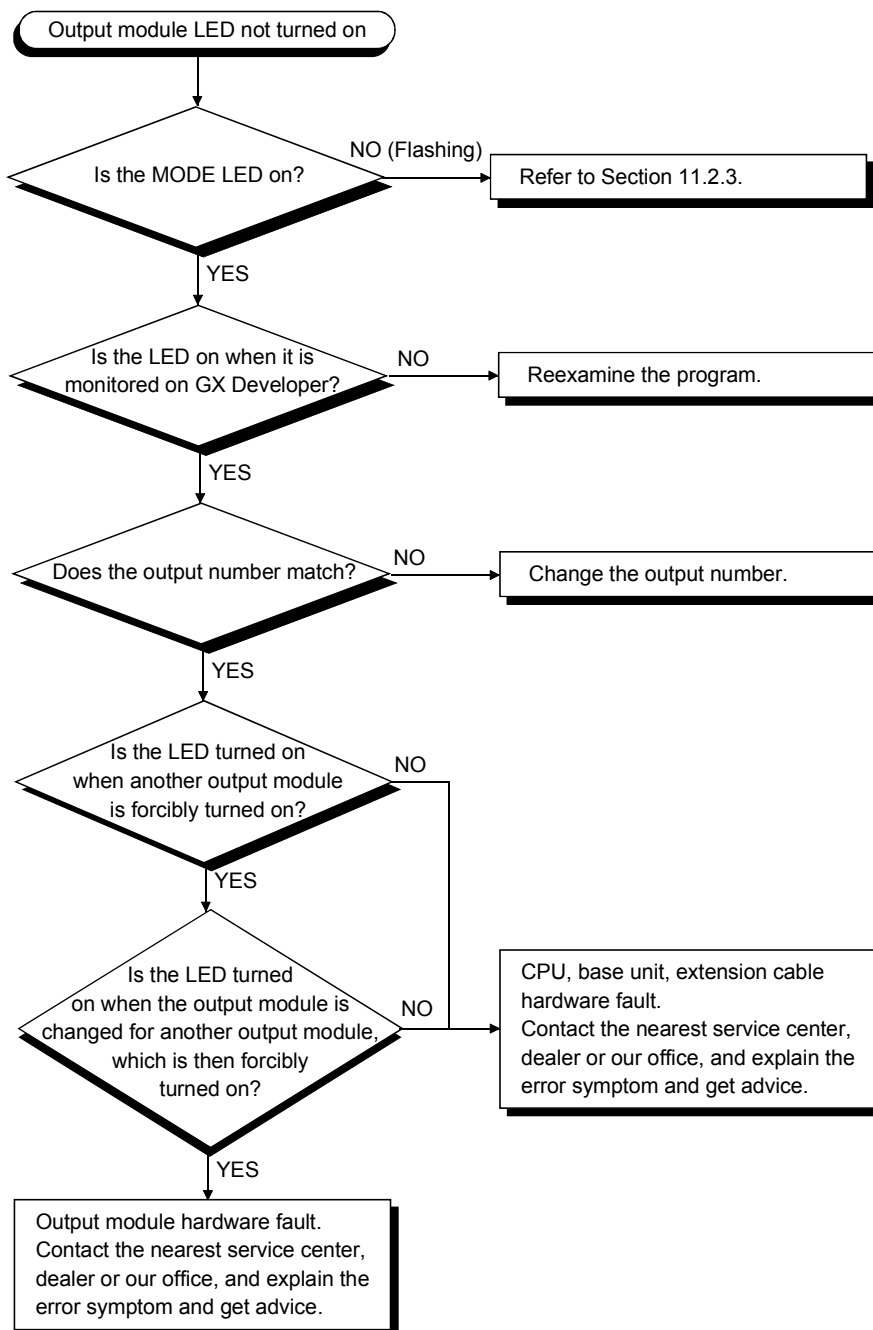
11.2.10 When "BOOT" LED is flashing

The following shows the flowchart to be followed when the "BOOT" LED flashes at power-on, operation start or during operation.



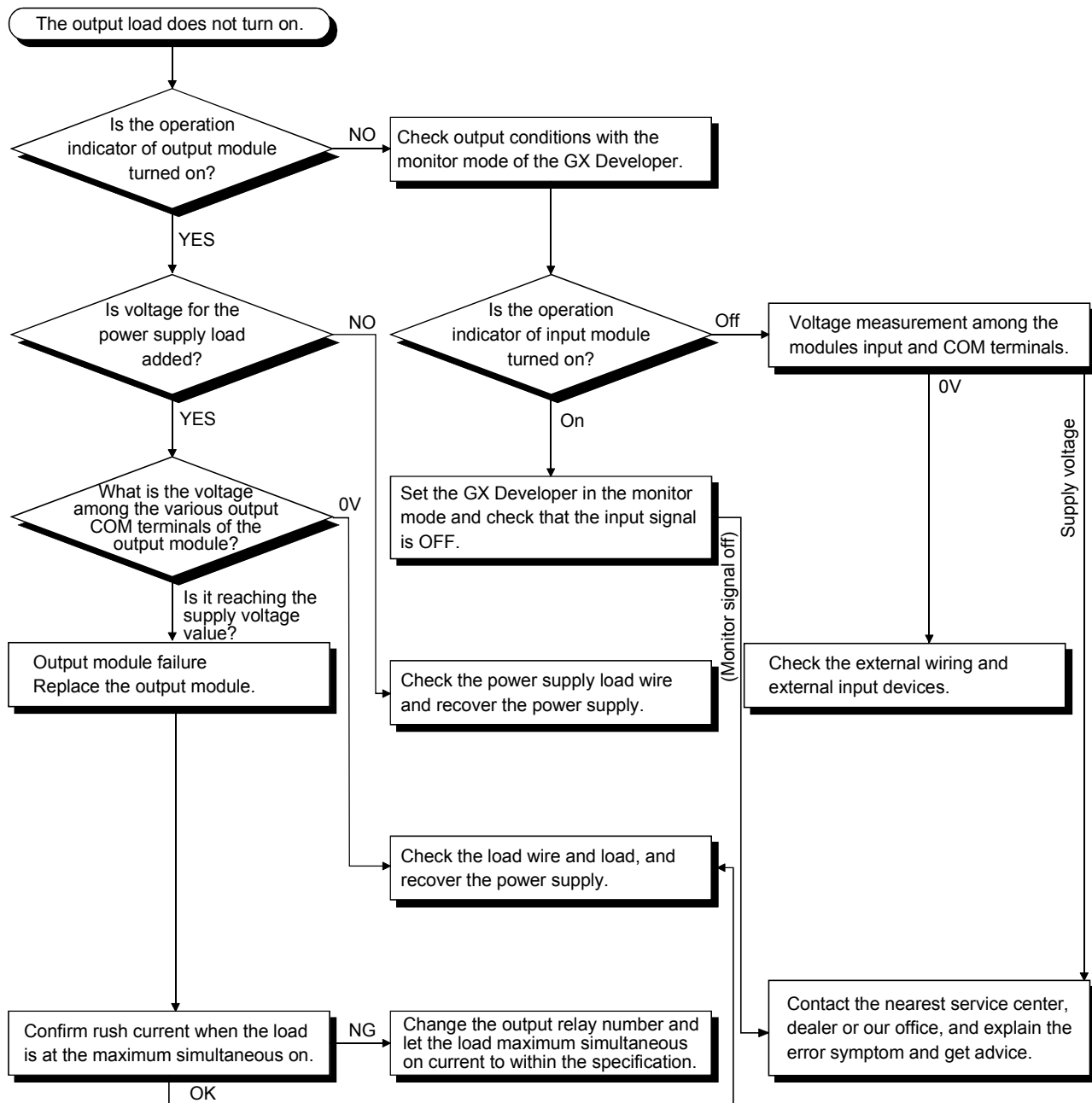
11.2.11 When output module LED is not turned on

The following shows the flowchart to be followed when the output module LED is not turned on during operation.



11.2.12 Flowchart for when output load of output module does not turn on

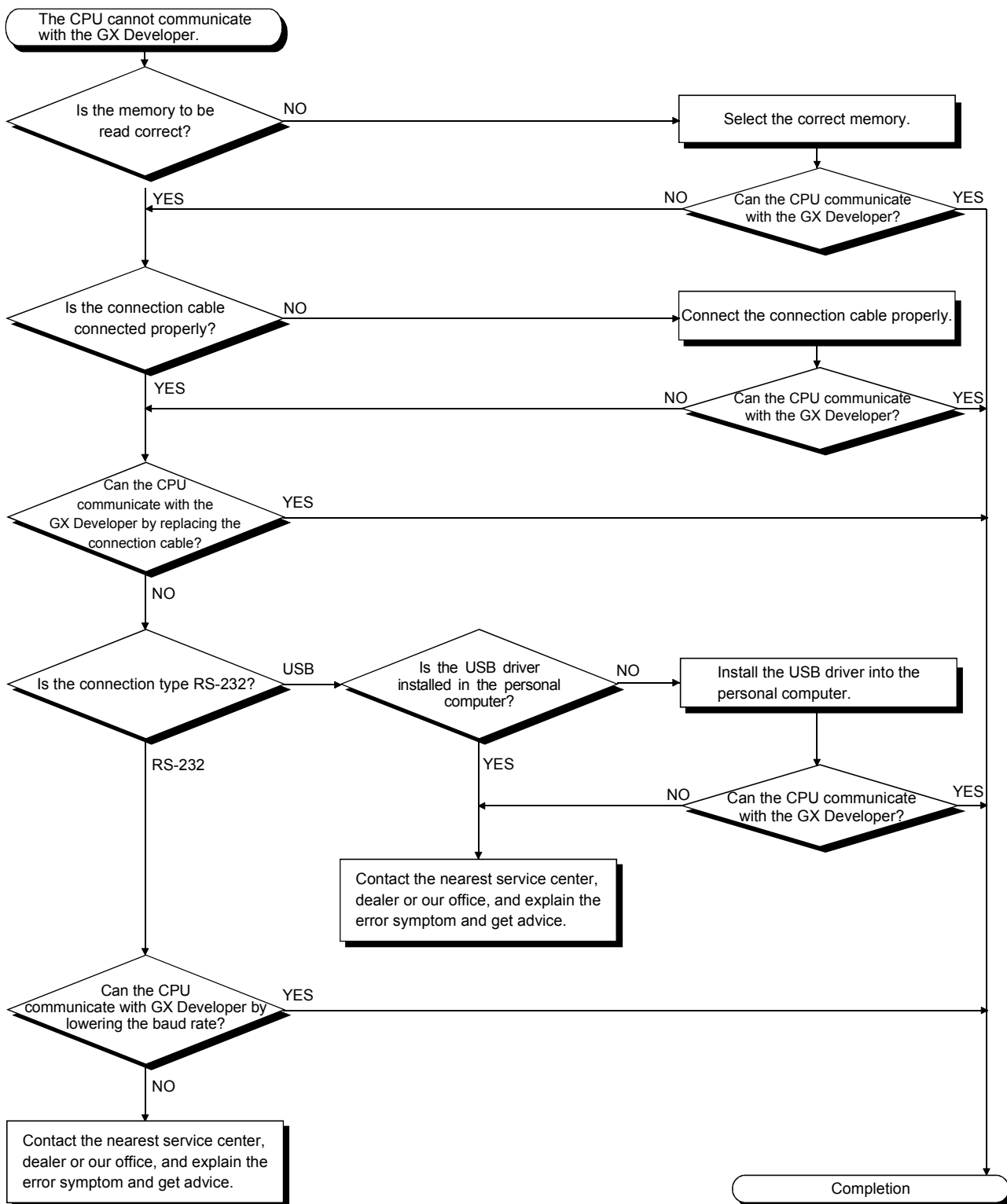
The following shows the flowchart that must be followed when the output load of the output module is not turned on during the operation.

**POINT**

For the trouble that the input signal to the input module is not turned off, troubleshoot referring to Section 11.5 Examples of Troubles with Input/output Modules.

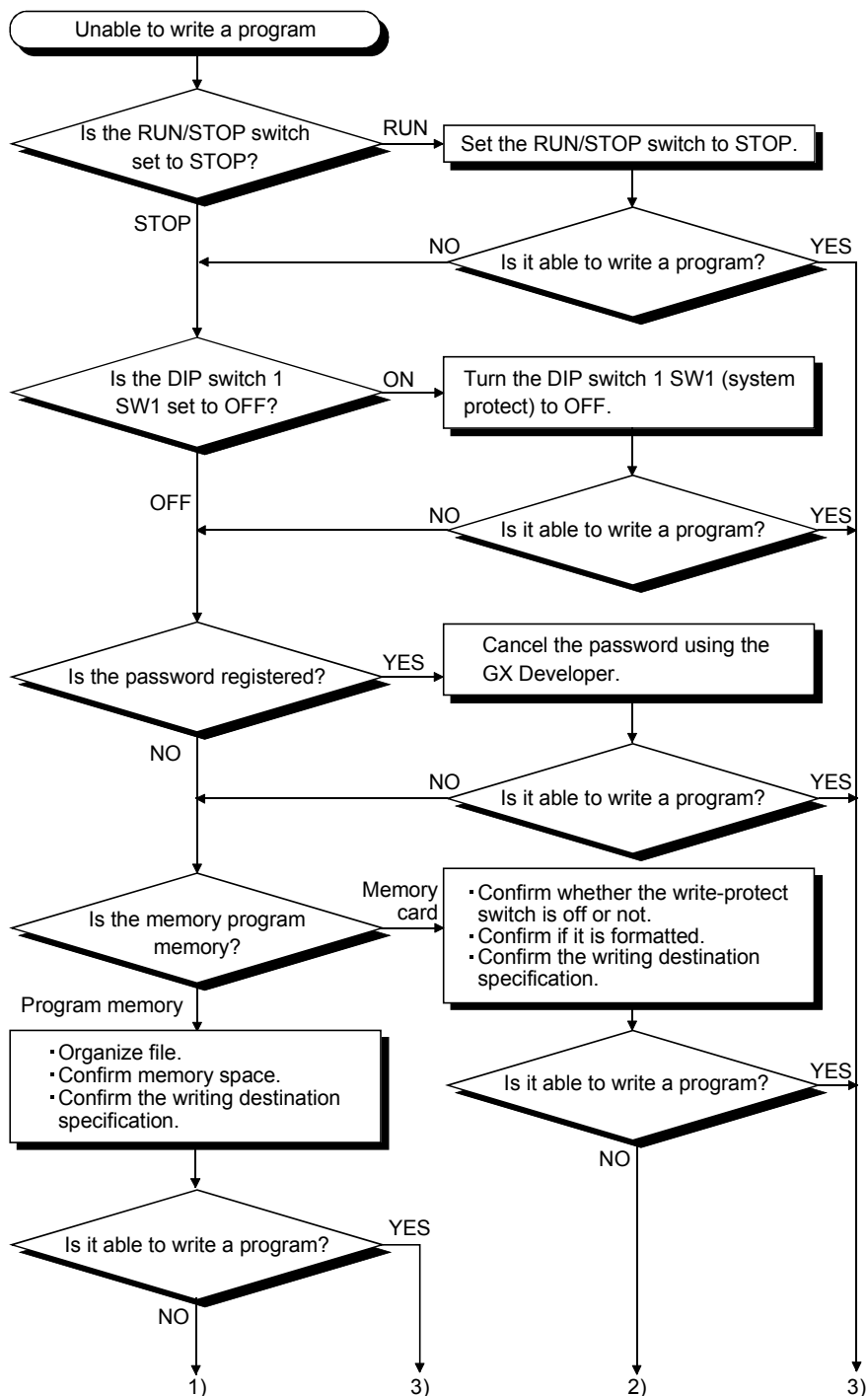
11.2.13 Flowchart for when unable to read a program

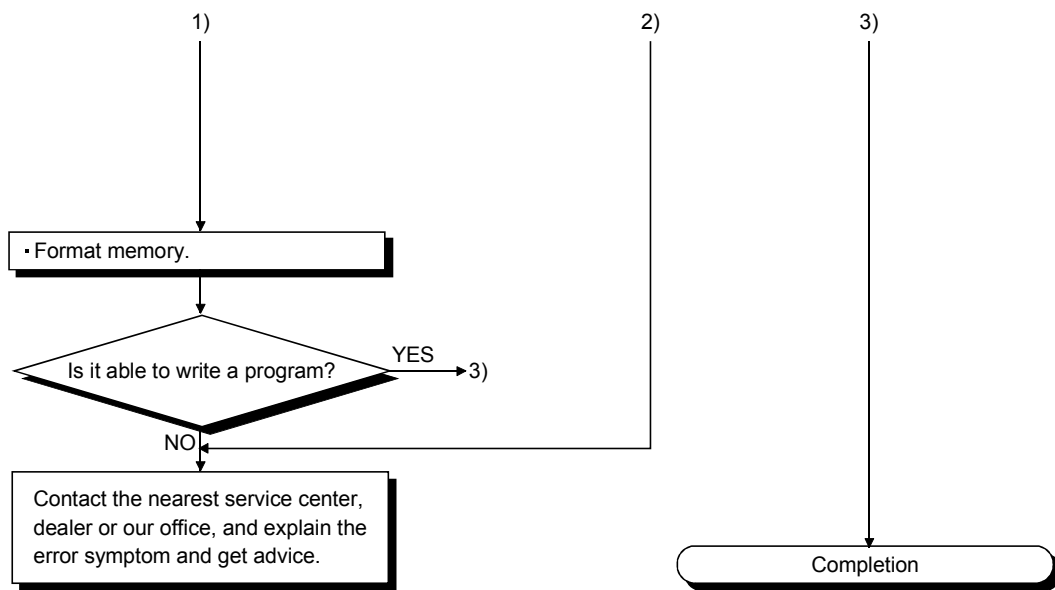
The following shows the flowchart that must be followed when the PLC cannot communicate with the GX Developer while the power supply is turned on.



11.2.14 Flowchart for when unable to write a program

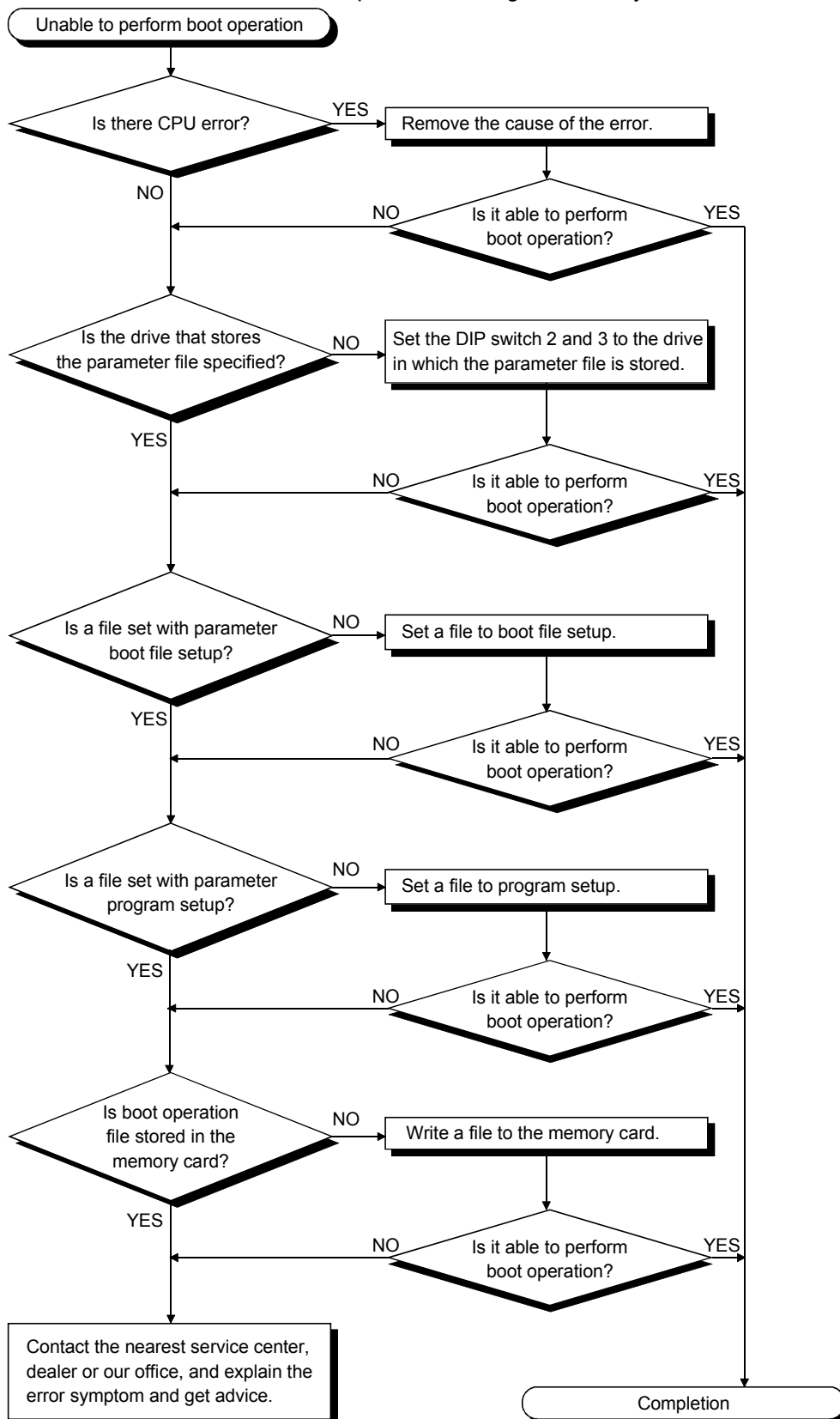
The following shows the flowchart that must be followed when programs cannot be written in the CPU module.





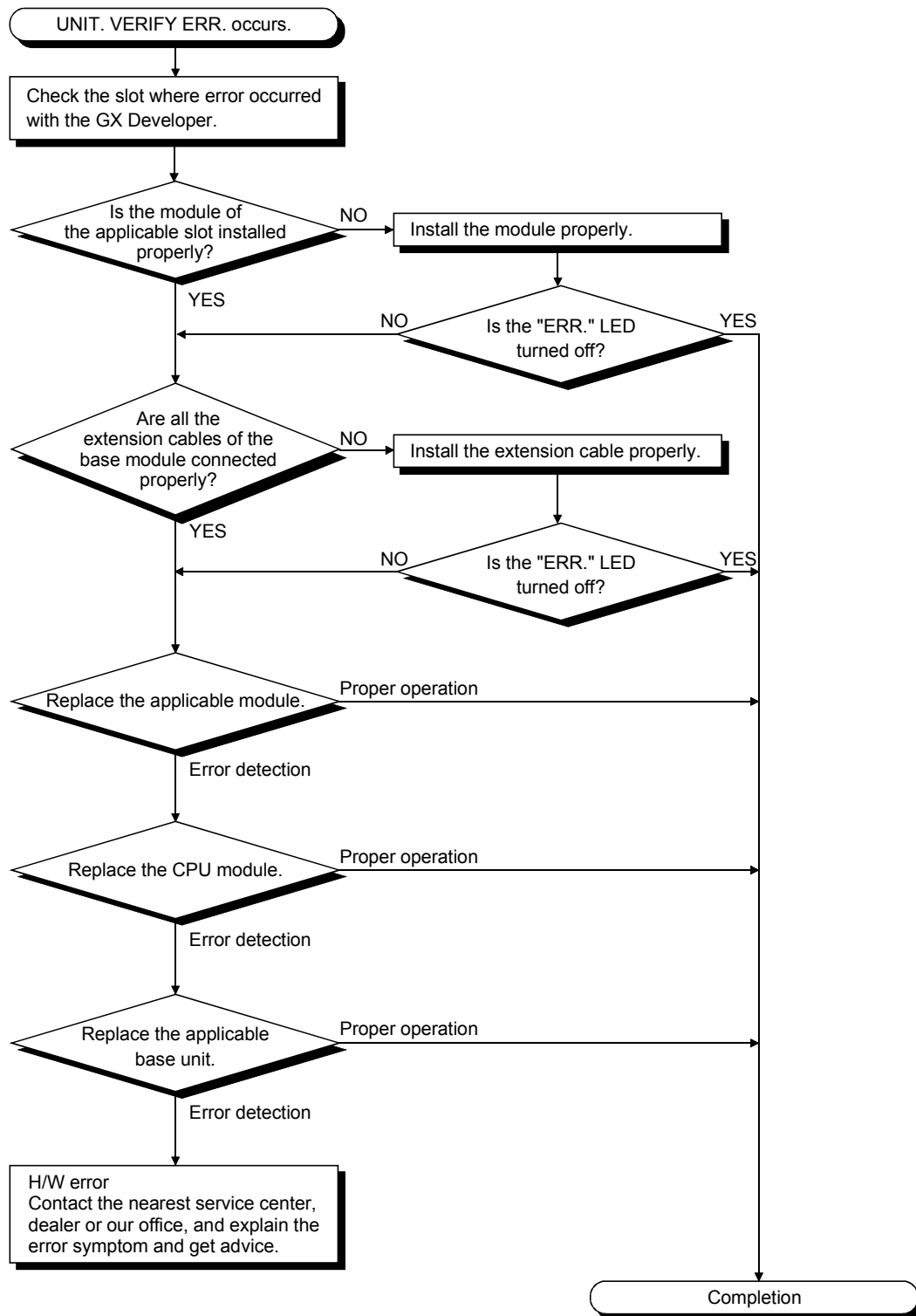
11.2.15 Flowchart for when it is unable to perform boot operation from memory card

The following shows the flowchart that must be followed when the boot operation of the CPU module cannot be performed using the memory card.



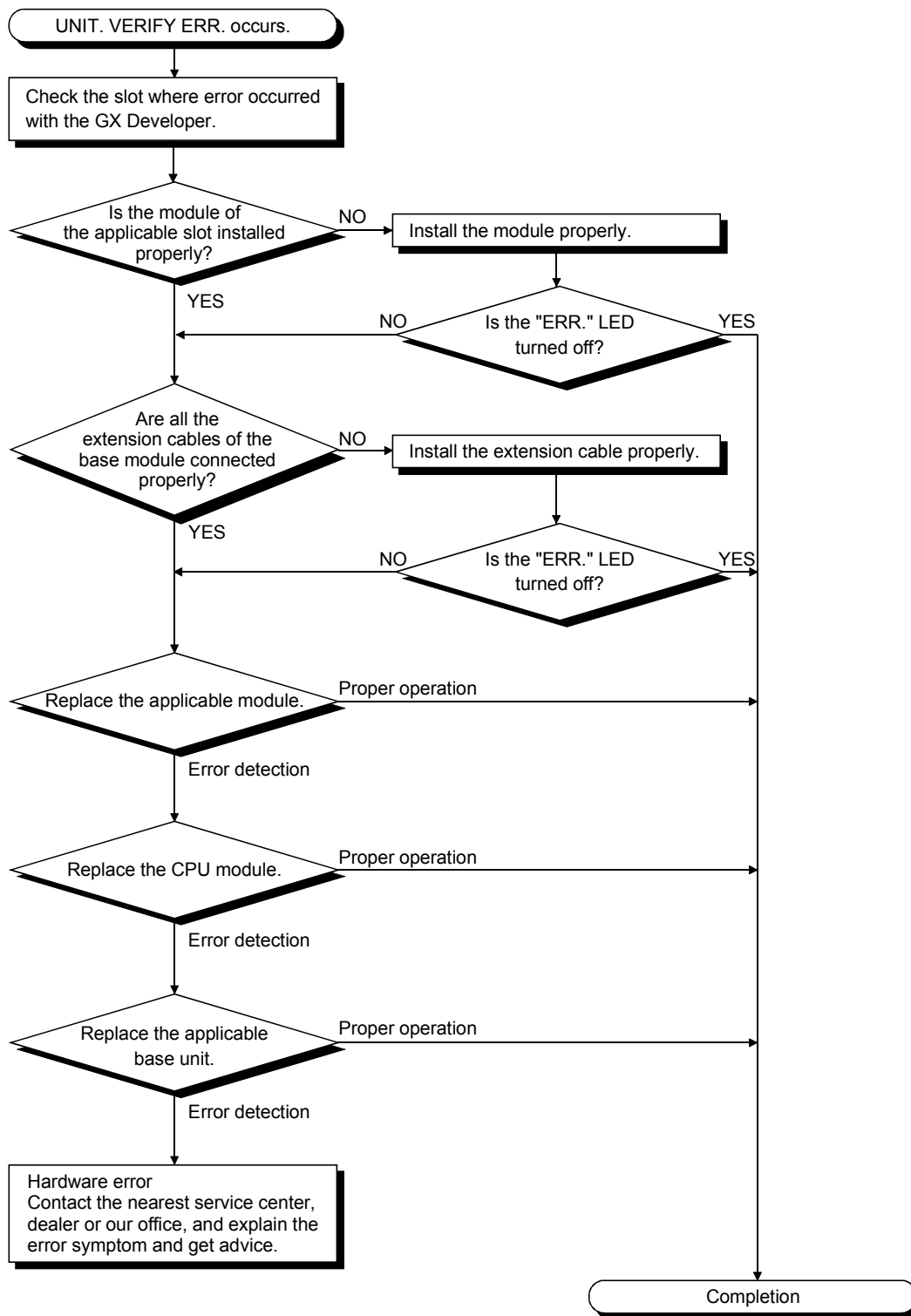
11.2.16 Flowchart for when UNIT VERIFY ERR. occurs

The following shows the flowchart to be followed when the UNIT VERIFY ERR. occurs while the power supply is turned on or during the operation.



11.2.17 Flowchart for when CONTROL BUS ERR. occurs

The following shows the flowchart that must be followed when the CONTROL BUS ERR. occurs while the power supply is turned on or during the operation. This flow chart can be confirmed only when a specific slot/base can be detected by the error code.



11.3 Error Code List

When the sequencer power supply is turned on and the sequencer is running or trouble occurs during the running, the High Performance model QCPU displays an error (by LED) using the self-diagnosis function, and stores the error information in the special relay SM and special register SD.

11.3.1 Procedure for reading error codes

When an error occurs, the error code and error message can be read by the GX Developer Version 4 or later.

The procedure for reading error codes by the GX Developer is as follows.

- 1) Start the GX Developer.
- 2) Connect the CPU module to the peripheral devices.
- 3) Select [Online] - [Read from PLC] Menu by the GX Developer, and also read the project from the High Performance model QCPU.
- 4) Select the [Diagnostics] - [Diagnostics PLC] Menu.
- 5) Click the 'Error Jump' button in the PLC diagnostics dialog box to display the error code and error message.
- 6) Select the [Help] - [CPU error] Menu, and confirm the content of the applicable error code.

For details of the GX Developer operating method, refer to the applicable the GX Developer Operating Manual.

11.3.2 Error Code List

The following information deals with error codes and the meanings, causes, and corrective measures of error messages.

"○" in the Corresponding CPU column indicates that the error is applied to all types of CPUs. "Rem" indicates compatibility with the remote I/O module. A CPU type name in the column indicates that the error is applied only to the specific CPU type.

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15) * 1	Individual Information (SD16 to 26) * 1	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
1000	MAIN CPU DOWN	—	—	Off	Flicker/On	Stop	Always	
1001				Off	Flicker	Stop	Always	
1002								
1003								
1004								
1005								
1006								
1007								
1008								
1009								
1010								
1011								
1012	END NOT EXECUTE	—	—	Off	Flicker	Stop	When an END instruction is executed.	
1101	RAM ERROR	—	—	Off	Flicker	Stop	At power ON/At reset	
1102								
1103								
1104								
1105								
1200	OPE. CIRCUIT ERR.	—	—	Off	Flicker	Stop	At power ON/At reset	
1201							When END instruction executed.	
1202								
1203								
1204								
1205								
1206							When instruction executed.	
1300	FUSE BREAK OFF	—	—	Off/ON	Flicker/On	Stop/ Continue * 2	When an END instruction is executed.	
1301	EX POWER OFF	Unit/module No.	—	Off/ON	Flicker/On	Stop/ Continue * 2	When an END instruction is executed.	
1310	I/O INT ERROR	Unit/module No.	—	Off	Flicker	Stop	During interrupt	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

	Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
	1000	Run mode suspended or failure of main CPU (1) Malfunctioning due to noise or other reason (2) Hardware fault	(1) Measure noise level. (2) Reset and establish the RUN status again. If the same error is displayed again, this suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	QnA
	1001	The main CPU runs away or has a failure. (1) Malfunctioning due to noise or other reason (2) Hardware fault	(1) Measure noise level. (2) Reset and establish the RUN status again. If the same error is displayed again, this suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	QCPU
	1002			
	1003			
	1004			
	1005			QCPU Rem
	1006			
	1007			
	1008			QCPU
	1009			
	1010	Entire program was executed without the execution of an END instruction.	(1) Measure noise level. (2) Reset and establish the RUN status again. If the same error is displayed again, this suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	○
	1011	(1) When the END instruction is executed it is read as another instruction code, e.g. due to noise. (2) The END instruction has been changed to another instruction code somehow.		
	1012			
	1101	Error in internal RAM where CPU sequence program is stored.	This suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	○
	1102	Error in RAM used as CPU work area.		
	1103	Internal CPU device error.		
	1104	RAM Address error in CPU.		
	1105	CPU shared memory fault	(1) Measure noise level. (2) Reset and establish the RUN status again. If the same error is displayed again, this suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	QCPU function Ver. B or later
	1200	The circuit that performs CPU internal index qualification is not operating properly.	This suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	○
	1201	Internal CPU hardware (logic) does not operate normally.		
	1202	The circuit that executes sequence processing in the CPU does not operate properly.		
	1203	The operation circuit that conducts index qualification in the CPU is not operating properly.	This suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	Q4AR
	1204	The hardware (logic) in the CPU is not operating properly.		
	1205	The operation circuit that conducts sequence processing in the CPU is not operating properly.		
	1206	The DSP operation circuit in the CPU is not operating properly.		
	1300	There is an output module with a blown fuse.	(1) Check ERR LED of the output modules and replace the module whose LED is lit. (2) The module with a blown fuse can also be checked with a peripheral device. Monitor special registers SD1300 to SD1331 and check if there is a bit "1," which corresponds to the module with a blown fuse.	QCPU Rem
		There is an output module with a blown fuse.	(1) Check blown fuse display LED of the output modules and replace the fuse of the module whose LED is lit. (2) Read the common error information with the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1".	QnA Q4AR
		(1) There is an output module with a blown fuse. (2) External power supply for output load is turned off or disconnected.	(1) Check ERR LED of the output modules and replace the module whose LED is lit. (2) The module with a blown fuse can also be checked with a peripheral device. Monitor special registers SD1300 to SD1331 and check if there is a bit "1," which corresponds to the module with a blown fuse. (3) Check whether the external power supply for output load is ON or OFF.	Q2AS
	1301	External power supply for output load is turned off or disconnected. (For future use)	Check whether the external power supply for output load is ON or OFF.	QCPU Rem
	1310	An interruption has occurred although there is no interrupt module.	One of the individual modules is experiencing hardware problems, so check the modules. Contact your nearest Mitsubishi representative and explain the problem with the defective module.	○

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
1401	SP. UNIT DOWN	Unit/module No.	——	Off/On	Flicker/On	Stop/ Continue * 3	At power ON/At reset/ When intelligent function module is accessed.	
							At power ON/At reset	
1402	SP. UNIT DOWN	Unit/module No.	Program error location	Off/On	Flicker/On	Stop/ Continue * 6	When an intelligent function module access instruction is executed.	
1403			——				During execution of FROM/TO instruction set.	
1411	CONTROL-BUS ERR.	Unit/module No.	Program error location	Off	Flicker	Stop	At power ON/At reset	
1412							During execution of FROM/TO instruction set.	
1413	CONTROL-BUS. ERR.	——	——	off	Flicker	Stop	Always	
1414	CONTROL-BUS. ERR.	Unit/module No.	——	Off	Flicker	Stop	When an END instruction is executed.	
	CONTROL-BUS. ERR.	——	——	off	Flicker	Stop	When an END instruction is executed	
Base No.		Off		Flicker	Stop	When an END instruction is executed		
1416		Unit/module No.		At power ON/At reset				
1421	SYS. UNIT DOWN * 3	——	——	off	Flicker	Stop	Always	
1500	AC DOWN	——	——	On	Off	Continue	Always	
1510	DUAL DC DOWN 5V * 4	——	——	on	on	Continue	Always	
1520	DC DOWN 5V * 5	——	——	off	Flicker	Stop	Always	
1530	DC DOWN 24V * 3	——	——	on	on	Continue	Always	
1600	BATTERY ERROR	Drive Name	——	ON	On	Continue	Always	
1601				BAT.ALM LED On				
1602								
2000	UNIT VERIFY ERR.	Unit/module No.	——	Off/On	Flicker/On	Stop/ Continue * 2	When an END instruction is executed.	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

* 3 This can only be detected in redundant systems. Detection is possible in either the control system or the standby system.

* 4 This can only be detected in the redundant system control system.

* 5 This can be detected in either a standalone system or a redundant system. However, in a redundant system it can only be detected in the control system.

* 6 Stop/continue operation is selectable for each module by setting parameters.

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
1401	- There was no response from the intelligent function module during initial communication stage. - The size of the buffer memory of the intelligent function module is wrong.	The CPU module is experiencing hardware problems. Contact your nearest Mitsubishi representative.	QCPU Rem
	When parameter I/O allocation was being made, there was no return signal from the special function module during initial processing stage. When error is generated, the initial I/O number of the special function module that corresponds to the common information is stored.	The special function module that was being accessed is experiencing hardware problems. Contact your nearest Mitsubishi representative.	QnA
1402	The intelligent function module was accessed in the program, but there was no response.	This suggests a CPU hardware error. Contact your nearest Mitsubishi representative.	QCPU Rem
	The special function module was accessed during the execution of a FROM/TO instruction set, but there was no response. When an error is generated, the program error location corresponding to the individual information is stored.	The special function module that was being accessed is experiencing hardware problems. Contact your nearest Mitsubishi representative.	QnA
1403	- There was no response from the intelligent function module when the END instruction is executed. - An error is detected at the intelligent function module.	The intelligent function module that was being accessed is experiencing hardware problems. Contact your nearest Mitsubishi representative.	QCPU Rem
1411	When performing a parameter I/O allocation a special function module could not be accessed during initial communications. On error occurring, the head I/O number of the corresponding special function module is stored in the common information.	A special function module, the CPU module, or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	○ Rem
1412	The FROM/TO instruction set could not be executed, due to a control pulse error with a special function module. On error occurring, the program error location is stored in the individual information.		○
1413	The QCPU of function version A was loaded in a multiple PLC system configuration.	(1) Change the QCPU of function version A for the QCPU of function version B. (2) An intelligent function module, CPU module or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	QCPU function Ver. B or later
	An error is detected on the system bus. • Wait-length time-out, arbitration time-out.	An intelligent function module, the CPU module, or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	QCPU Rem
1414	Fault of the loaded module was detected. The QCPU of function version A was loaded in a multiple PLC system configuration.	(1) Change the QCPU of function version A for the QCPU of function version B. (2) An intelligent function module, CPU module or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	QCPU function Ver. B or later
	An error is detected on the system bus.	An intelligent function module, the CPU module, or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	QCPU Rem
1415	Fault of the main or extension base unit was detected.	An intelligent function module, CPU module or the base unit is experiencing problems. Contact your nearest Mitsubishi representative.	QCPU function Ver. B or later
1416	Bus fault was detected at power-on or reset.		
1421	Hardware fault at the system management module AS92R.	This is experiencing hardware problems. Contact your nearest Mitsubishi representative.	Q4AR
1500	A momentary power supply interruption has occurred. The power supply went off.	Check the power supply.	○ Rem
1510	The 5 VDC supplied to one of the two power-supply modules in the redundant system extension base has dropped below 85% of the rated voltage.	Check the supply voltage of the power module. If the voltage is abnormal then replace the power module.	Q4AR
1520	The 5 VDC supplied to the power-supply modules in the extension base has dropped below 80% of the rated voltage.		
1530	The 24 VDC power supplied to the system management module AS92R has dropped below 85% of the rated voltage.		
1600	(1) Voltage in the CPU module battery. (2) The CPU module battery is not connected.	(1) Change the battery. (2) If the battery is for internal RAM or for the back-up power function, install a lead connector.	○
1601	Voltage of the battery on memory card 1 has dropped below stipulated level.	Change the battery.	
1602	Voltage of the battery on memory card 2 has dropped below stipulated level.	Change the battery.	QnA
2000	Input/output module information power ON is changed. Input/output module (or special function module) not installed properly or installed on the base unit.	Read the error common information at the peripheral device, and check and/or change the module that corresponds to the numerical value (module number) there. Alternatively, monitor the special registers SD1400 to SD1431 at a peripheral device, and change the fuse at the output module whose bit has a value of "1".	○ Rem
	The QCPU of function version A was loaded in a multiple CPU system configuration.	Change the QCPU of function version A for the QCPU of function version B.	QCPU function Ver. B or later

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
2100	SP. UNIT LAY ERR.	Unit/module No.	——	Off	Flicker	Stop	At power ON/At reset	
2101								
2102	SP. UNIT LAY ERR.	Unit/module No.	——	Off	Flicker	Stop	At power ON/At reset	
2103								
2104								
2105								
2106	SP. UNIT LAY ERR.	Unit/module No.	——	Off	Flicker	Stop	At power ON/At reset	
2107	SP. UNIT LAY ERR.	Unit/module No.	——	Off	Flicker	Stop	At power ON/At reset	
2108								
2109 * 6								

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 6 This can only be detected in the redundant system standby system.

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
2100	Slot loaded with the QI60 is set to other than the Intel (intelligent function module) or Interrupt (interrupt module) in the parameter I/O assignment.	Make setting again to match the parameter I/O assignment with the actual loading status.	QCPU function Ver. B or later
	(1) In the parameter I/O allocation settings, an Intel (intelligent function module) was allocated to a location reserved for an I/O module or vice versa. (2) In the parameter I/O allocation settings, a module other than CPU (or nothing) was allocated to a location reserved for a CPU module or vice versa. (3) A general-purpose switch was set to the module with no general-purpose switches.	(1) Reset the parameter I/O allocation setting to conform to the actual status of the intelligent function module and the CPU module. (2) Delete the general-purpose switch settings.	QCPU Rem
	In parameter I/O allocation settings, a special function module was allocated to a location reserved for an I/O module. Or, the opposite has happened.	Reset the parameter I/O allocation setting to conform with the actual status of the special function modules.	QnA
	13 or more A-series special function modules (except for the QI60, A1SI61) that can initiate an interrupt to the CPU module have been installed.	Keep the number of A-series special function modules that can initiate an interrupt (except for the QI60, A1SI61) to 12 or fewer.	QCPU
2101	13 or more special function modules (not counting the AI61) capable of sending an interrupt to the CPU module have been installed.	Keep the number of special function modules that can initiate an interrupt (with the exception of the QI60, AI61 module) to 12 or fewer.	QnA
	7 or more A1SD51S have been installed.	Keep the number of A1SD51S to 6 or fewer.	QCPU
2102	7 or more computer link modules (excludes A (1S) J71QC24) have been installed.	Keep the number of computer link modules (excludes A (1S) J71QU24) installed to 6 or fewer.	QnA Rem
	(1) Two or more QI60/A1SI61 modules are loaded in a single-PLC system. (2) Two or more QI60/A1SI61 modules are set to the same control PLC in a multiple-PLC system. (3) Two or more A1SI61 modules are loaded in a multiple-PLC system.	(1) Reduce the number of QI60/A1SI61 modules loaded in the single-PLC system to one. (2) Change the number of QI60/A1SI61 modules set to the same control PLC to only one in the multiple-PLC system. (3) Reduce the number of A1SI61 modules to only one in the multiple-PLC system. When using an interrupt module with each QCPU in a multiple-PLC system, change it for the QI60. (Use one A1SI61 module + max. three QI60 modules or only the QI60 modules.)	QCPU function Ver. B or later
2103	Two or more QI60, A1SI61 interrupt modules have been installed.	Install only 1 QI60, A(1S)I61 module.	QCPU
	The QI60 is loaded.	Remove the QI60.	
	Two or more A1SI61 interrupt modules have been installed.	Install only 1 AI61 module.	QnA
2104	At the MELSECNET/MINI auto refresh parameter settings, the module allocation that was set is different from the actual module models at the station numbers in the link system.	Reset the parameter MELSECNET/MINI auto refresh unit module allocation setting so that it conforms to the station number of the module that is actually linked.	QnA
2105	There are too many special function modules that can use dedicated instructions allocated (number of modules installed). (The total of the figures indicated below is above 1344.) (Number of AD59 modules installed × 5) (Number of AD57 (S1)/AD58 modules installed × 8) (Number of AJ71C24 (S3/S6/S8) modules installed × 10) (Number of AJ71UC24 modules installed × 10) (Number of AJ71C21 (S1) modules installed × 29) (Number of AJ71PT32-S3/AJ71T32-S3 modules installed × 125) * (Number of AJ71QC24 (R2, R4) modules installed × 29) (Number of AJ71ID1 (2)-R4 modules installed × 18) (Number of AD75 modules installed × 12) Total > 1344	Reduce the number of special function modules installed. * : When the expansion mode is used.	QnA
2106	• Five or more MELSECNET/H modules are loaded in a whole multiple-PLC system. • Five or more Q series Ethernet interface modules are loaded in a whole multiple-PLC system.	Reduce the number of modules to four or less in the whole multiple-PLC system.	QCPU function Ver. B or later
	(1) 5 or more MELSECNET/H modules have been installed. (2) 5 or more Q series Ethernet interface modules have been installed. (3) Identical network numbers or station numbers exist in the MELSECNET/10 network system.	(1) Keep the number to 4 or fewer. (2) Keep the number to 4 or fewer. (3) Check the network numbers and station numbers.	QCPU Rem
	(1) 5 or more AJ71QLP21 & AJ71QBR11 modules are installed. (2) 3 or more AJ71AP21/R21 & AJ71AT21B modules are installed. (3) The total number of installed AJ71QLP21, AJ71QBR11, AJ71AP21/R21, and AJ71AT21B modules exceeds 5. (4) Identical network Nos. or identical station Nos. exist at the MELSECNET/10 network system. (5) 2 or more master or load stations exist simultaneously at the MELSECNET(II) or MELSECNET/B data link system.	(1) Install 4 or fewer modules. (2) Install 2 or fewer modules. (3) Reduce the total number of modules to 4 or less. (4) Check the network Nos. and station Nos. (5) Check the station Nos.	QnA
	Head X/Y set in the parameter I/O allocation settings is also the head X/Y for another module.	Reset the parameter I/O allocation setting to conform with the actual status of the special function modules.	○ Rem
2108	(1) Network module A1SJ71LP21, A1SJ71BR11, A1SJ71AP21 *, A1SJ71AR21, or A1SJ71AT2B * dedicated for the A2USCPU has been installed. (2) Network module A1SJ71QLP21 or A1SJ71QBR11 dedicated for the Q2AS has been installed.	Change network module to QJ71LP21 or QJ71BR11.	QCPU
	A(1s)J71LP21 or A(1s)J71BR11 for use with the AnUCPU network module has been installed.	Change network module to A(1s)J71QLP21 or A(1s)J71QBR11.	QnA
2109 * 6	The control system and standby system module configurations are different when a redundant system is in the backup mode.	Check the module configuration of the standby system.	Q4AR

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 6 This can only be detected in the redundant system standby system.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
2110	SP. UNIT ERROR	Unit/module No.	Program error location	Off/On	Flicker/On	Stop/ Continue * 2	When instruction executed.	
2111								
2112	SP. UNIT ERROR	Unit/module No.	Program error location	Off/On	Flicker/On	Stop/ Continue * 2	When instruction executed/ STOP → RUN	
2113		FFFF _H (fixed)						
2114	SP. UNIT ERROR	Unit/module No.	Program error location	Flicker/On	Flicker/On	Continue/ Stop	When instruction is executed	
2115								
2116								
2117								
2120								
2121	SP. UNIT LAY ERR.	—	—	Off	Flicker	Stop	At power ON/At reset	
2122								
2124								
2125								
2126								
2150	SP. UNIT VER. ERR.	Unit/module No.	—	Off	Flicker	Stop	At power ON/At reset	
2200	MISSING PARA.	Drive Name	—	Off	Flicker	Stop	At power ON/At reset	
2210	BOOT ERROR	Drive Name	—	Off	Flicker	Stop	At power ON/At reset	
2300	ICM. OPE. ERROR	Drive Name	—	Off/On	Flicker/On	Stop/ Continue * 2	When memory card is inserted or removed	
2301								
2302								
2400	FILE SET ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/At reset	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
2110	Station not loaded was specified using the instruction whose target was the PLC share memory. (1) The location designated by the FROM/TO instruction set is not a special function module. (2) The special function module, Network module being accessed is faulty.	Read the individual information of the error, check the program corresponding that value (program error location), and make correction. (1) Read error individual information, then check and edit the FROM/TO instruction set that corresponds to the numerical value there (Program error location). (2) The special function module that is being accessed has a hardware error. Consult the nearest service center, agent or our branch office and describe the symptom.	QCPU function Ver. B or later ○
2111	The location designated by a link direct device (J□□) is not a network module.		
2112	(1) The location designated by a special function module dedicated instruction is not a special function module. (2) The network number specified by the network dedicated instruction does not exist, or the network module is not the corresponding one. (3) Alternatively, it is not the relevant special function module.	Read error individual information, then check and edit the special function module (Network module) dedicated instruction that corresponds to the numerical value there (program error location).	○ Rem
2113	The one specified in the network-dedicated instruction is not a network module, or a relay target network does not exist.		○
2114	An instruction, which on execution specifies other stations, has been used for specifying the host station. (An instruction that does not allow the host station to be specified).	Read the individual information of the error, check the program corresponding that value (program error location), and make correction.	QCPU function Ver. B or later
2115	An instruction, which on execution specifies the host station, has been used for specifying other stations. (An instruction that does not allow other stations to be specified).		
2116	• An instruction that does not allow the module under the control of another station to be specified is being used for a similar task. • Instruction was executed for the A or QnA module under control of another station.	Read the individual information of the error, check the program corresponding that value (program error location), and make correction.	QCPU function Ver. B or later
2117	A CPU that cannot be specified in the instruction dedicated to the multiple PLC system was specified.		
2120	The location of Q□B and QA1S□B is improper.	Check the location of the base unit.	
2121	The CPU module is installed at other than the CPU slot or slots 0 to 2.	Check the loading position of the CPU module and reinstall it at the correct slot.	
2122	QA1S□B is used to the main base unit.	Use Q3□B as the main base unit.	
2124	(1) A module is installed at 65th or higher slot. (2) A module is installed at the slot later than the number of slots specified with base allocation setting. (3) A module is installed at the I/O points later than the 4,096th point. (4) A module installed at the 4,096th point occupies higher points.	(1) Remove the module installed at 65th or later slot. (2) Remove the module installed at the slot later than the number of slots specified with base allocation setting. (3) Remove the module installed at the I/O points later than the 4,096th point. (4) Change the last module to a module which does not exceed the 4,096th point.	QCPU Rem
2125	(1) A module which the QCPU cannot recognise has been installed. (2) There was no response from the intelligent function module.	(1) Install a module which can be used with the CPU. (2) The intelligent function module is experiencing hardware problems. Contact your nearest Mitsubishi representative.	
2126	CPU module locations in a multiple PLC system are either of the following. (1) There are empty slots between the QCPU and QCPU/motion controller. (2) Modules other than the QCPU (including the motion controller) modules are loaded between the QCPU modules.	(1) Eliminate empty slots between the CPU modules. (Set empty slots on the right side of the CPU modules.) (2) Remove the modules, which are not the QCPU modules, loaded between the QCPU modules, and fit the slots with the QCPUs. Load the motion controller modules on the right side of the QCPUs.	QCPU function Ver. B or later
2150	In a multiple PLC system, the control CPU of the intelligent function module incompatible with the multiple PLC system is set to other than station 1.	(1) Change the intelligent function module for the one compatible with the multi-CPU system (function version B). (2) Change the setting of the control CPU of the intelligent function module incompatible with the multi-CPU system to station 1.	
2200	There is no parameter file at the drive designated by DIP switches as a valid drive.	Check and correct the setting of the parameter enabled drive switch. Put a parameter file in the drive designated by the parameter enabled drive switch.	○
2210	The contents of the boot file are incorrect. There is no boot file in the drive designated by the parameter enabled drive switch even though the Boot DIP switch is ON.	Check the boot setting. Check and correct the setting of the parameter enabled drive switch. Put a boot file in the drive designated by the parameter enabled drive switch.	QCPU QnA
2300	(1) A memory card was removed without switching the memory card in/out switch OFF. (2) The memory card in/out switch is turned ON although a memory card is not actually installed.	(1) Remove memory card after placing the memory card in/out switch OFF. (2) Turn on the card insert switch after inserting a memory card.	○
2301	(1) The memory card has not been formatted. (2) Memory card format status is incorrect.	(1) Format memory card. (2) Reformat memory card. Check memory card.	
2302	A memory card that cannot be used with the CPU has been installed.		
2400	Automatic write to standard ROM was performed on the QCPU that is incompatible with automatic write to standard ROM. (Memory card where automatic write to standard ROM was selected in the boot file was fitted and the parameter enable drive was set to the memory card.) The file designated at the PLC file settings in the parameters cannot be found. The Ethernet parameter that was added for QnACPU, with the function version "B," has been set to QnACPU without the function version "B."	(1) Execute automatic write to standard ROM on the QCPU which is compatible with automatic write to standard ROM. (2) Using GX Developer, perform write of parameters and programs to standard ROM. (3) Change the memory card for the one where automatic write to standard ROM has not been set, and perform boot operation from the memory card. Read the error individual information at the peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct. Create the designated file. Change to QnACPU with the function version "B." Delete the Ethernet parameter.	QCPU function Ver. B or later ○ QnA

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
2401	FILE SET ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/At reset	
2410	FILE OPE. ERROR	File name	Program error location	Off/On	Flicker/ON	Stop/ Continue * 2	When instruction is executed	
2411								
2412								
2413								
2500	CANT EXE. PRG.	File name	—	Off	Flicker	Stop	At power ON/At reset	
2501								
2502								
2503								
2504								
3000	PARAMETER ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3001								
3002								
3003	PARAMETER ERROR	File name/drive name	Parameter number	Off	Flicker	Stop	When an END instruction is executed.	
	PARAMETER ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3004	PARAMETER ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3009	PARAMETER ERROR	File name/drive name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3010								
3012								
3013								

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
2401	Program memory capacity was exceeded by performing boot operation or automatic write to standard ROM.	(1) Check and correct the parameters (boot setting). (2) Delete unnecessary files in the program memory. (3) Choose "Clear program memory" for boot in the parameter so that boot is started after the program memory is cleared.	QCPU function Ver. B or later
	The file designated at the parameter PLC RAS settings fault history area has not been created.	Read the error individual information at the peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct. Check the space remaining in the memory card.	○
2410	The file designated by the sequence program cannot be found.	Read the error individual information at the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Create the designated file.	○
2411	The sequence program designated a file that cannot be designated by the sequence program (comment file, etc.).	Read the error individual information at the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.	
2412	The SFC program file is one that cannot be designated by the sequence program.	Read the error individual information at the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.	
2413	No data has been written to the file designated by the sequence program.	Read the error individual information at the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Check to ensure that the designated file has not been write protected.	
2500	There is a program file that uses a device that exceeds the device allocation range designated by the parameter device settings.	Read the error common information at the peripheral device, check to be sure that the parameter device allocation setting and the program file device allocation correspond to the numerical values there (file name), and correct if necessary.	○
2501	There are multiple program files although "none" has been set at the parameter program settings.	Edit the parameter program setting to "yes". Alternatively, delete unneeded programs.	○
2502	The program file is incorrect. Alternatively, the file contents are not those of a sequence program.	Check whether the program version is * * * .QPG, and check the file contents to be sure they are for a sequence program.	
2503	There are no program files at all.	Check program configuration.	
2504	Two or more SFC normal programs or control programs have been designated.	Check parameters and program configuration.	
3000	In a multiple PLC system, the intelligent function module under control of another station is specified in the interrupt pointer setting of the parameter.	(1) Specify the first I/O number of the intelligent function module under control of the host station. (2) Delete the interrupt pointer setting of the parameter.	QCPU function Ver. B or later
	The parameter settings for timer time limit setting, the RUN-PAUSE contact, the common pointer number, the general data processing, number of vacant slots, or system interrupt settings are outside the range that can be used by the CPU.	(1) Read the error detailed information at the peripheral device, check the parameter items corresponding to the numerical values (parameter numbers) there, and correct when necessary. (2) If the error is still generated following the correction of the parameter settings, it is likely that there is a memory error, either in the standard RAM or on the memory card. Contact your nearest Mitsubishi representative.	○ Rem
3001	Parameter contents have been destroyed.		○
3002	When "use the following files" is selected for the file registers in the PLC file setting parameter, the specified file does not exist though the file register capacity has been set.		
3003	The automatic refresh range of the multiple PLC system exceeded the file register capacity.	Change the file register file for the one refresh-enabled in the whole range.	QCPU function Ver. B or later
	The number of devices set at the parameter device settings exceeds the possible CPU range.	(1) Read the error detailed information at the peripheral device, check the parameter items corresponding to the numerical values (parameter numbers) there, and correct when necessary. (2) If the error is still generated following the correction of the parameter settings, it is likely that there is a memory error, either in the internal CPU RAM or on the memory card. Contact your nearest Mitsubishi representative.	○
3004	The parameter file is incorrect. Alternatively, the contents of the file are not parameters.	Check whether the parameter file version is * * * .QPA, and check the file contents to be sure they are parameters.	
3009	A modules are set to control PLCs in a multiple PLC system.	Re-set the parameter I/O assignment to control them under one QCPU. (Change the parameters of all stations in the multi-CPU system.)	QCPU function Ver. B or later
3010	The parameter-set number of CPU modules differs from the actual number in a multiple PLC system.	Match (preset count of multi-CPU setting) - (CPU (empty) setting in I/O assignment) with the actual number of CPUs loaded.	
3012	Multiple PLC setting or control PLC setting differs from that of the reference station in a multiple PLC system.	Match the multi-CPU setting or control CPU setting in the parameter with that of the reference station (station 1).	
3013	Multiple PLC automatic refresh setting is any of the followings in a multiple PLC system. (1) When a bit device is specified as a refresh device, a number other than a multiple of 16 is specified for the refresh-starting device. (2) The device specified is other than the one that may be specified. (3) The number of send points is an odd number.	Check the following in the multi-CPU automatic refresh parameters and make correction. (1) When specifying the bit device, specify a multiple of 16 for the refresh starting device. (2) Specify the device that may be specified for the refresh device. (3) Set the number of send points to an even number.	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
3100	LINK PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3101								
3102								
3103								
3104								
3105								
3106	LINK PARA. ERROR	File name/drive name	Parameter number	Off	Flicker	Stop	When an END instruction is executed.	
	LINK PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3107	LINK PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3200	SFC PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	STOP → RUN	
3201								
3202								
3203								
3300	SP. PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
3100	In a multiple PLC system, the MELSECNET/H under control of another station is specified as the first I/O number in the network setting parameter of the MELSECNET/H.	(1) Delete the MELSECNET/H network parameter of the MELSECNET/H under control of another station. (2) Change the setting to the first I/O number of the MELSECNET/H under control of the host station.	QCPU function Ver. B or later
	The network parameters of the MELSECNET/H operating in the ordinary station were rewritten to the control station, or the network parameters of the MELSECNET/H operating in the control station were rewritten to the ordinary station. (The network parameters are reflected on the module side by making a reset.)	Reset the QCPU.	
	(1) The number of actually installed modules is different from that designated in the number of modules setting parameter of MELSECNET/H. (2) The head I/O number of actually installed modules is different from that designated in the network parameter of MELSECNET/H. (3) Some data in the parameter cannot be handled. (4) The station type of MELSECNET/H has been changed while the power is on. (RESET → RUN is required to change the station type.)	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	QCPU
	Network parameters have not been written although the QnACPU is the control station, or the master station.	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	
3101	• When the station number of the MELSECNET/H module is 0, the inter-PLC network parameter setting has been made. • When the station number of the MELSECNET/H module is other than 0, the remote master parameter setting has been made.	Correct the type or station number of the MELSECNET/H module in the parameter to meet the used system.	QCPU function Ver. B or later
	The network No. specified by a parameter is different from that of the actually mounted network. The head I/O No. specified by a parameter is different from that of the actually mounted I/O unit. The network class specified by a parameter is different from that of the actually mounted network. The network refresh parameter of the MELSECNET/10(H) is out of the specified area.	Match the data specified by the parameters with those of the actually mounted network and units.	
3102	An error was discovered when the network parameter check was made at the network module.	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	○
3103	In a multiple PLC system, the Q series Ethernet interface module under control of another station is specified as the first I/O number of the Ethernet setting parameter.	(1) Delete the Ethernet setting parameter of the Q series Ethernet interface module under control of another station. (2) Change the setting to the first I/O number of the Q series Ethernet interface module under control of the host station.	QCPU function Ver. B or later
	• Though the number of Ethernet module is set to one or more in the parameter, the actually mounted number of units is zero. • The head I/O number for the Ethernet module set parameter is different from that of the actually mounted module. AJ71QE71 does not exist in the position of I/O number set by the parameter. I/O number designation is overlapping. Numbers of the parameter and loaded AJ71QE71 are different. Ethernet (parameter + dedicated instruction) is set to more than 5.	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	
3104	Ethernet and MELSECNET/10 use the same network number. Network number, station number or group number set by the parameter is out of range. I/O number is out of range.	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	QnA
	In a multiple PLC system, the Q series CC-Link module under control of another station is specified as the first I/O number of the CC-Link setting parameter.	(1) Delete the CC-Link setting parameter of the Q series CC-Link module under control of another station. (2) Change the setting to the first I/O number of the Q series CC-Link module under control of the host station.	
3105	(1) Though the number of CC-Link module set in the network parameters is one or more, the actually mounted number of units is zero. (2) The head I/O number in the common parameters is different from that of the actually mounted module. (3) The station class for the CC-Link module quantity set parameters is different from that of the actually mounted station.	(1) Write after correcting network parameters. (2) If the error persists after corrections have been made, contact your nearest Mitsubishi representative.	QCPU function Ver. B or later
	The contents of the Ethernet parameter are incorrect.	Write after correcting parameters.	
3106	The CC-Link link refresh range exceeded the file register capacity.	Change the file register file for the one refresh-enabled in the whole range.	QCPU function Ver. B or later
	The network refresh parameter for CC-Link is out of range.	Check the parameter setting.	
3107	The contents of the CC-Link parameter are incorrect.	Check the parameter setting.	○
3200	The parameter contents are incorrect.	Write after correcting parameters.	○
3201	The contents of the SFC block attribute information are incorrect.		
3202	The number of step relays designated in the parameters is less than the number used by the program.		
3203	The execution type set for an SFC program in the parameters is other than the scan execution type.		
3300	The first I/O number in the intelligent function module parameter set on GX Configurator differs from the actual I/O number.	Check the parameter setting.	QCPU Rem

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) ※ 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
3301	SP. PARA. ERROR	File name	Parameter number	Off	Flicker	Stop	When an END instruction is executed.	
3302							At power ON/Reset/ STOP → RUN	
3303	SP. PARA. ERROR	File name/drive name	Parameter number	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3400	REMOTE PASS. ERROR	_____	_____	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
3401								
4000	INSTRCT CODE ERR.	Program error location	_____	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
4001								
4002								
4003								
4004	INSTRCT CODE ERR.	Program error location	_____	Off	Flicker	Stop	At power ON/Reset/ STOP → RUN	
4010	MISSING END INS.	Program error location	_____	Off	Flicker	Stop		
4020	CAN'T SET (P)	Program error location	_____	Off	Flicker	Stop		
4021								
4030	CAN'T SET (I)	Program error location	_____	Off	Flicker	Stop		
4100	OPERATION ERROR	Program error location	_____	Off/On	Flicker/On	Stop/ continue ※ 2	When instruction is executed	
4101						Stop/ Continue ※ 2		
4102		Program	Program error location					
		Program error location	_____			Stop/ continue ※ 2		
4103						Stop/ Continue ※ 2		
4107		Program	Program error location					
		Program error location	_____			Stop/ continue ※ 2		
4200	FOR NEXT ERROR	Program error location	_____	Off	Flicker	Stop	When instruction is executed	
4201	FOR NEXT ERROR	Program error location	_____	Off	Flicker	Stop	When instruction is executed	
4202								
4203								

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
3301	The refresh setting of the intelligent function module exceeded the file register capacity.	Change the file register file for the one which allows refresh in the whole range.	QCPU function Ver. B or later
	The intelligent function module's refresh parameter setting is outside the available range.	Check the parameter setting.	QCPU Rem
3302	The intelligent function module's refresh parameter are abnormal.	Check the parameter setting.	QCPU
3303	In a multiple PLC system, automatic refresh setting or similar parameter setting was made to the intelligent function module under control of another station.	(1) Delete the automatic refresh setting or similar parameter setting of the intelligent function module under control of another station. (2) Change the setting to the automatic refresh setting or similar parameter setting of the intelligent function module under control of the host station.	QCPU function Ver. B or later QCPU function Ver. B or later
3400	The first I/O number of the target module in the remote password file is set to other than 0H to 0FF0H.	Change the first I/O number of the target module to within the 0H to 0FF0H range.	
3401	Position specified as the first I/O number of the remote password file is incorrect due to one of the following reasons: • Module is not loaded. • Other than a Q-compatible intelligent function module (I/O, A, QnA module) • Intelligent function module other than QJ71C24(-R2) or Q series Ethernet interface module • QJ71C24(-R2) or Q series Ethernet interface module of function version A	Load the QJ71C24(-R2) or Q series Ethernet interface module of function version B in the position specified as the first I/O number of the remote password file.	
	QJ71C24(-R2) or Q series Ethernet interface module of function version B under control of another station is specified in a multiple PLC system.	(1) Change the setting to the QJ71C24(-R2) or Q series Ethernet interface module of function version B under control of the host station. (2) Delete the remote password setting.	
4000	The program contains an instruction code that cannot be decoded. An unusable instruction is included in the program.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4001	The program contains a dedicated instruction for SFC program although it is not an SFC program.		○ Rem
4002	The extension instruction designated by the program has an incorrect instruction name.		
4003	The extension instruction designated by the program has an incorrect number of devices.		
4004	The extension instruction designated by the program a device which cannot be used.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4010	There is no END (FEND) instruction in the program.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4020	The total number of internal file pointers used by the program exceeds the number of internal file pointers set in the parameters.		
4021	The common pointer numbers used by individual files overlap.		
4030	The allocation pointer numbers used by individual files are overlap.		
4100	The instruction cannot process the contained data.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4101	The designated device number for data processed by the instruction exceeds the usable range. Alternatively, the stored data or constants for the devices designated by the instruction exceeds the usable range.		
4102	In a multiple PLC system, the link direct device (J□G□) was specified for the network module under control of another station.	(1) Delete from the program the link direct device which specifies the network module under control of another station. (2) Using the link direct device, specify the network module under control of the host station.	QCPU function Ver. B or later
	The network number and station number designated with a dedicated network instruction are not correct. The link direct device (J□G□) is not set correctly. • The module No./network No./character string count specified by the extension instruction is outside the setting range. • The character string (" ") specified by the extension instruction is unusable.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○ Rem
4103	The configuration of the PID dedicated instruction is incorrect.		○
4107	33 or more multiple PLC dedicated instructions were executed from one QCPU.	Using the multiple PLC dedicated instruction completion bit, provide interlocks to prevent one QCPU from executing 32 or more multiple PLC dedicated instructions.	QCPU function Ver. B or later
	Numbers of execution to the CC-Link instruction are beyond 64.	Set the numbers of execution to the CC-Link instruction to 64 or less.	QnA
4108	The CC-Link parameter is not set when the CC-Link instruction is executed.	Execute the CC-Link instruction after setting the CC-Link parameter.	
4200	No NEXT instruction was executed following the execution of a FOR instruction. Alternatively, there are fewer NEXT instructions than FOR instructions.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4201	A NEXT instruction was executed although no FOR instruction has been executed. Alternatively, there are more NEXT instructions than FOR instructions.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
4202	More than 16 nesting levels are programmed.	Keep nesting levels at 16 or under.	
4203	A BREAK instruction was executed although no FOR instruction has been executed prior to that.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
				RUN	ERROR			
4210	CAN'T EXECUTE (P)	Program error location	———	Off	Flicker	Stop	When instruction is executed	
4211								
4212								
4213								
4220	CAN'T EXECUTE (I)	Program error location	———	Off	Flicker	Stop	When instruction is executed	
4221								
4223								
4230								
4231	INST. FORMAT ERR.	Program error location	———	Off	Flicker	Stop	When instruction is executed	
4235								
4300								
4301								
4400	SFCP. CODE ERROR	Program error location	———	Off	Flicker	Stop	STOP → RUN	
4410	CAN'T SET (BL)	Program error location	———	Off	Flicker	Stop	STOP → RUN	
4411								
4420								
4421								
4422	CAN'T SET (S)	Program error location	———	Off	Flicker	Stop	STOP → RUN	
4500								
4501								
4502								
4503	SFCP. FORMAT ERR.	Program error location	———	Off	Flicker	Stop	STOP → RUN	
4504								
4600								
4601								
4602	SFCP. OPE. ERROR	Program error location	———	Off/On	Flicker/On	Stop/Continue * 2	When instruction is executed	
4610								
4611								
4620								
4621	BLOCK EXE. ERROR	Program error location	———	Off	Flicker	Stop	When instruction is executed	
4630								
4631								
4632								
4633	STEP EXE. ERROR	Program error location	———	Off	Flicker	Stop	When instruction is executed	
5000								
5001								
5010								
5010	PRG. TIME OVER	Time (value set)	Time (value actually measured)	On	On	Continue	Always	
5011								
6000								
6010								
6100	TRK. MEMORY ERR. * 3	———	———	on	on	Continue	At power on/Reset/STOP → RUN	
6101							When END instruction executed	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 3 Can only be detected in a redundant system. Can be detected either in the control system or the standby system.

* 4 Can only be detected in the control system of a redundant system.

* 5 Can only be detected in the standby system of a redundant system.

	Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
	4210	The CALL instruction is executed, but there is no subroutine at the specified pointer.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
	4211	There was no RET instruction in the executed sub-routine program.		
	4212	The RET instruction was before the FEND instruction in the main program.		
	4213	More than 16 nesting levels are programmed.		
	4220	Interrupt input was generated, but no corresponding interrupt pointer was found.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	
	4221	There was no IRET instruction in the executed interrupt program.		
	4223	The IRET instruction was before the FEND instruction in the main program.		
	4230	The number of CHK and CHKEND instructions is not equal.		
	4231	The number of IX and IXEND instructions is not equal.		
	4235	The configuration of the check conditions for the CHK instruction is incorrect. Alternatively, a CHK instruction has been used in a low-speed program.	Read the common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	QnA
	4300	The designation of a MELSECNET/MINI-S3 master module control instruction was wrong.		
	4301	The designation of an AD57/AD58 control instruction was wrong.		
	4400	No SFCP or SFCPEND instruction in SFC program.		
	4410	The block number designated by the SFC program exceeds the range.	Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
	4411	Block number designations overlap in SFC program.		
	4420	A step number designated in an SFC program exceeds 511.		
	4421	Total number of steps in all SFC programs exceed the range		
	4422	Step number designations overlap in SFC program.	Reduce total number of steps to below the maximum.	
	4500	The numbers of BLOCK and BEND instructions in an SFC program are not equal.	Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	
	4501	The configuration of the STEP * to TRAN * to TSET to SEND instructions in the SFC program is incorrect.		
	4502	There was no STEPI * instruction in SFC program block.		
	4503	The step designated by the TSET instruction in the SFC program does not exist.		
	4504	The step designated by the TAND instruction in the SFC program does not exist.	Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	
	4600	The SFC program contains data that cannot be processed.		Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. The program is automatically subjected to an initial start.
	4601	Exceeds device range that can be designated by the SFC program.		
	4602	The START instruction in an SFC program is proceeded by an END instruction.		
	4610	The active step information at presumptive start of an SFC program is incorrect.	Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
	4611	Key-switch was reset during RUN when presumptive start was designated for SFC program.		
	4620	Startup was executed at a block in the SFC program that was already started up.		
	4621	Startup was attempted at a block that does not exist in the SFC program.		
	4630	Startup was executed at a block in the SFC program that was already started up.	Read common error information at a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	○
	4631	Startup was attempted at a block that does not exist in an SFC program.		
	4632	There were too many simultaneous active steps in blocks that can be designated by the SFC program.		
	4633	There were too many simultaneous active steps in all blocks that can be designated.		
	5000	Program scan time for initial execution type programs exceeds the initial execution WDT time setting designated in the PLC RAS parameter.	Read the error individual information at a peripheral device, check the numerical value (time) there, and shorten scan time if necessary.	○
	5001	The program scan time goes over the WDT value set in the parameter PLC RAS parameter.		
	5010	(1) The scan time of the program exceeded the constant scan setting time specified in the PC RAS setting parameter. (2) The low-speed program execution time specified in the PC RAS setting parameter exceeded the margin time of constant scan.	(1) Review the constant scan setting time. (2) Review the constant scan time and low-speed program execution time in the parameter so that the margin time of constant scan may be fully reserved.	○
	5011	Low-speed scan type program scan time goes over the low-speed execution WDT set in the parameter PC RAS settings.	Read the error individual information at a peripheral device, check the numerical value (time) there, and shorten scan time if necessary.	
	6000	The control system and standby system in the redundant system do not have the same programs and parameters.	Synchronise the programs and parameters of the control system and standby system.	Q4AR
	6010	The operational status of the control system and standby system in the redundant system is not the same.	Synchronise the operation statuses of the control system and standby system.	
	6100	A CPU module tracking memory error was detected during initial.	Because this is a CPU module hardware error, contact your nearest Mitsubishi representative. To replace the module, replace the standby system CPU first, then the control system CPU.	Q4AR
	6101	The CPU module detected an error during the handshake for tracking.	Check the condition of the other stations.	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

Error Code (SD0) * 1	Error Messages	Common Information (SD5 to 15)	Individual Information (SD16 to 26)	LED Status		Operating States of CPU	Diagnostic Timing	
6200	CONTROL EXE. * 4	Cause of switch	——	on	off	Continue	Always	
6210	CONTROL WAIT. * 5	Cause of switch	——	on	off	Continue	Always	
6220	CAN'T EXE CHANGE * 4	Cause of switch	——	on	on	Continue	Always	
6221								
6222								
7000	MULT CPU DOWN	Unit/module No.	——	Off	Flicker	Stop	Always	
7002							At power ON/Reset	
7003							At power ON/Reset	
7010	MULTI EXE. ERROR	Unit/module No.	——	Off	Flicker	Stop	At power ON/Reset	
7020	MULTI CPU ERROR	Unit/module No.	——	On	On	Continue	Always	
9000	F*** * 6	Program error location	Annunciator number	On	Off	Continue	When instruction is executed	
9010	<CHK> ERR ***-*** * 7	Program error location	Failure No.	On	Off			
9020	BOOT OK	——	——	Off	Flicker	Stop	At power ON/Reset	
10000	CONT. UNIT ERROR	——	——	——	——	——	——	

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 4 Can only be detected in the control system of a redundant system.

* 6 **** indicates detected annunciator number.

* 7 *** indicates detected contact and coil number.

Error Code (SD0) * 1	Error Contents and Cause	Corrective Action	Corresponding CPU
6200	The standby system in a redundant system is switched to the control system.	Check the control system condition.	Q4AR
6210	The control system in a redundant system is switched to the standby system.	Check the control system condition.	
6220	The standby system in a redundant system could not be switched from the control system to the standby system because of an error status or other reason.	Check the standby system condition.	
6221	Switching is disabled because of a bus switching module error.	Because this is a bus switching module hardware error, contact your nearest Mitsubishi representative.	
6222	Switching is disabled because a multiplexed master station of a remote I/O network was installed in the standby station during initial.	Check the remote I/O network setting.	
7000	(1) In a multiple PLC system, at PLC fault occurred at a station where "all station stop by stop error of PLC" was selected in the operating mode. (2) QCPU of function version A was loaded in a multiple PLC system.	(1) Read the individual information of the error, check the error of the PLC resulting in PLC fault, and remove the error. (2) Remove the QCPU of function version A from the main base unit.	QCPU function Ver. B or later
	In a multiple PLC system, station 1 resulted in stop error at power-on and the other stations cannot start. (This error occurred at stations 2 to 4)	Read the individual information of the error, check the error of the CPU resulting in CPU fault, and remove the error.	
7002	(1) There is no response from the target station in a multiple PLC system at initial communication stage. (2) QCPU of function version A was loaded in a multiple PLC system configuration.	(1) Reset the QCPU and run it again. If the same error is displayed again, it is a hardware fault of any PLC. Consult your sales representative. (2) Remove the QCPU of function version A from the main base unit.	
7003	There is no response from the target station in a multiple PLC system at initial communication stage.	Reset the QCPU and run it again. If the same error is displayed again, it is a hardware fault of any PLC. Consult your sales representative.	
7010	(1) Faulty CPU is loaded in a multiple PLC system. (2) QCPU of function version A is loaded in a multiple PLC system configuration. (An error is detected at the QCPU of function version B.) (3) In a multiple PLC system, any of stations 2 to 4 was reset during power-on. (This error occurs at only the station which was reset.)	(1) Read the individual information of the error and change the faulty station. (2) Change the station of function version A for function version B. (3) Do not reset the QCPUs of stations 2 to 4. Reset the QCPU of station 1 and restart the multi-CPU system.	QCPU function Ver. B or later
7020	In a multiple PLC system, a PLC fault occurred at a station where "all station stop by stop error of PLC" was not selected in the operation mode. (The error is detected at the QCPU of other than the station where the PLC fault occurred.)	Read the individual information of the error, check the error of the PLC resulting in PLC fault, and remove the error.	
9000	Annunciator F was set ON	Read the error individual information at a peripheral device, and check the program corresponding to the numerical value (annunciator number).	○
9010	Error detected by the CHK instruction.	Read the error individual information at a peripheral device, and check the program corresponding to the numerical value (error number) there.	
9020	Storage of data onto ROM was completed normally in automatic write to standard ROM. (BOOT LED also flickers.)	Set the parameter enable drive to standard ROM, switch power on again, and perform boot operation from standard ROM.	QCPU function Ver. B or later
10000	In the multiple PLC system, an error occurred in the CPU module other than the QCPU.	Use the software package of the corresponding CPU module to check the details of the error that occurred.	QCPU function Ver. B or later

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

11.4 Canceling of Errors

The QCPU can perform the cancel operation for errors only when the errors allow the CPU to continue its operation.

To cancel the errors, follow the steps shown below.

- 1) Eliminate the cause of the error.
- 2) Store the error code to be canceled in the special register SD50.
- 3) Energize the special relay SM50 (OFF → ON).
- 4) The error to be canceled is canceled.

After the CPU is reset by the canceling of the error, the special relays, special registers, and LEDs associated with the error are returned to the states under which the error occurred.

If the same error occurs again after the cancellation of the error, it will be registered again in the error history.

When multiple enunciators(F) detected are canceled, the first one with No. F only is canceled.

POINT	
	When the error is canceled with the error code to be canceled stored in the SD50, the lower two digits of the code is neglected. (Example) If the error code 2100 is canceled when the error codes 2100 or 2111 appear, the error code 2111 will also be canceled (all errors with error codes 2100 to 2199 will be canceled).

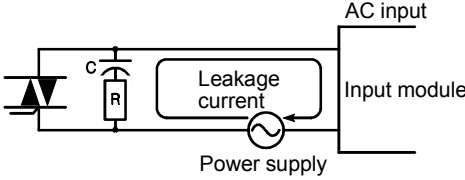
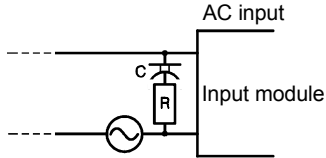
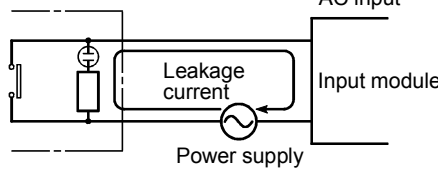
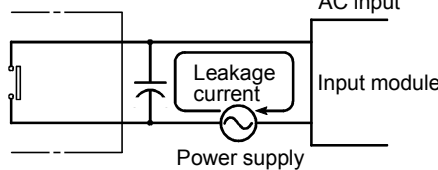
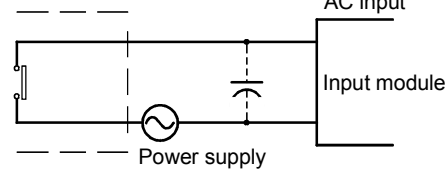
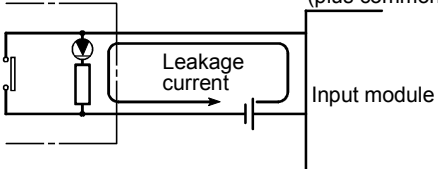
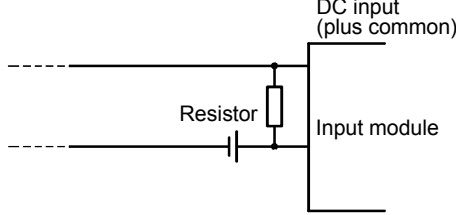
11.5 I/O Module Troubleshooting

This chapter explains possible problems with I/O circuits and their corrective actions.

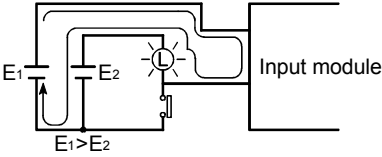
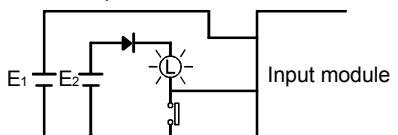
11.5.1 Input circuit troubleshooting

This section describes possible problems with input circuits and their corrective actions.

Input Circuit Problems and Corrective Actions

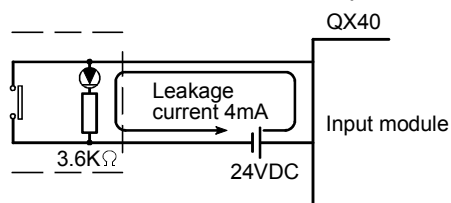
	Condition	Cause	Corrective Action
Example 1	Input signal does not turn OFF.	Leakage current of input switch (e.g. drive by non-contact switch). 	Connect an appropriate resistor which will make the voltage across the terminals of the input module lower than the OFF voltage value.  It is recommended to use 0.1 to $47\mu\text{F} + 47$ to 120Ω ($1/2\text{W}$) for the CR constant.
Example 2	Input signal does not turn OFF.	Drive by a limit switch with neon lamp. 	- Same as Example 1. - Or make up another independent display circuit.
Example 3	Input signal does not turn OFF.	Leakage current due to line capacity of wiring cable. (Line capacity C of twisted pair wire is approx. 100PF/m). 	- Same as Example 1. - However, leakage current is not generated when the power supply is located in the input equipment side as shown below. 
Example 4	Input signal does not turn OFF.	Drive by switch with LED indicator. 	Connect a resistor which will make the voltage between the input module terminal and common higher than the OFF voltage, as shown below.  * A calculation example of a value for a connected resistor is given on the following page.

Input Circuit Problems and Corrective Actions (Continued)

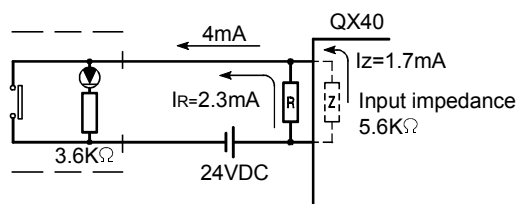
	Condition	Cause	Corrective Action
Example 5	Input signal does not turn OFF.	Sneak path due to the use of two power supplies. 	- Use only one power supply. - Connect a sneak path prevention diode. (Figure below) 
Example 6	False input due to noise	Depending on response time setting, noise is imported as input.	Change response time setting. Example : 1ms → 5ms (Setting of a shorter response time may produce a higher effect on periodic excessive noise.) If no effects are produced by the above, take basic actions to prevent excessive noise from entering, e.g. avoid bundling the power and I/O cables, and suppress noise by adding surge absorbers to such noise sources as relays and conductors used with the same power supply.)

<Calculation example of Example 4>

Consider a switch with LED indicator connected to the QX40, giving a 4mA leakage current of 4mA when a 24VDC power is turned on.



(1) The 1.7mA OFF current of the QX40 is not satisfied. Hence, connect a resistor as shown below.



(2) Calculate the resistor value R as indicated below.

To satisfy the 1.7mA OFF current of the QX40, the resistor R to be connected may be the one where 2.3mA or more will flow.

$I_R: I_Z = Z$ (Input impedance): R

$$R \leq \frac{I_Z}{I_R} \times Z \text{ (Input impedance)} = \frac{1.7}{2.3} \times 5.6 = 4.14 [\text{k}\Omega]$$

$$R < 4.14 \text{ k}\Omega.$$

Assuming that resistor R is $3.9 \text{ k}\Omega$, the power capacity W of resistor R is:

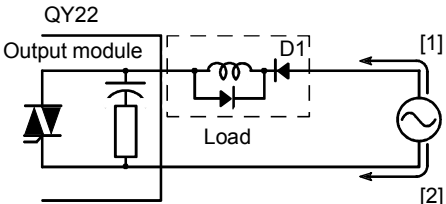
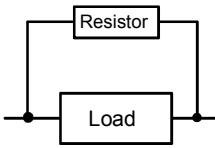
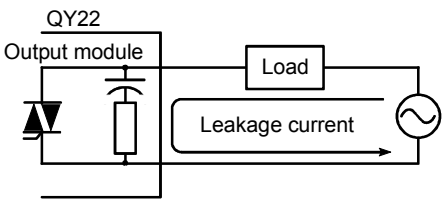
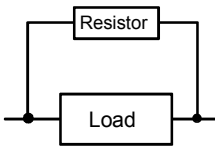
$$W = (\text{input voltage})^2 \div R = 28.8^2 \div 3900 = 0.2 (\text{W})$$

(3) The power capacity of the resistor selected is 3 to 5 times greater than the actual current consumption. A $3.9 (\text{k}\Omega)$, 0.6 to 1.0 (W) resistor may therefore be connected to the terminal in question.

11.5.2 Output circuit troubleshooting

This section describes possible problems with output circuits and their corrective actions.

Output Circuit Problems and Corrective Actions

	Condition	Cause	Corrective Action
Example 1	When the output is OFF, excessive voltage is applied to the load.	- Load is half-wave rectified inside (in some cases, this is true of a solenoid).  - When the polarity of the power supply is as shown in [1], C is charged. When the polarity is as shown in [2], the voltage charged in C plus the line voltage are applied across D1. Max. voltage is approx. 2.2E. (If a resistor is used in this way, it does not pose a problem to the output element. But it may cause the diode, which is built into the load, to deteriorate, resulting in a fire, etc.)	Connect a resistor several tens to hundreds of $k\Omega$ across the load. 
Example 2	The load does not turn OFF (triac output).	Leakage current due to built-in noise suppression. 	Connect C and R across the load. (When the wiring distance from the output card to the load is long, there may be a leakage current due to the line capacity.) 

11.6 Special Relay List

Special relays, SM, are internal relays whose applications are fixed in the programmable controller. For this reason, they cannot be used by sequence programs in the same way as the normal internal relays.

However, they can be turned ON or OFF as needed in order to control the CPU and remote I/O modules.

The headings in the table that follows have the following meanings.

Item	Function of Item
Number	• Indicates the number of the special relay.
Name	• Indicates the name of the special relay.
Meaning	• Indicates the nature of the special relay.
Explanation	• Contains detailed information about the nature of the special relay.
Set by (When set)	• Indicates whether the relay is set by the system or user, and, if it is set by the system, when setting is performed. <Set by> - S : Set by system - U : Set by user (in sequence program or test operation at a peripheral device) - S/U : Set by both system and user <When set> → indicated only if setting is done by system. - Each END : Set during each END processing - Initial : Set only during initial processing (when power supply is turned ON, or when going from STOP to RUN) - Status change : Set only when there is a change in status - Error : Set when error is generated - Instruction execution : Set when instruction is executed - Request : Set only when there is a user request (through SM, etc.)
Corresponding ACPU M9 □ □ □	• Indicates special relay M9 □ □ □ corresponding to the ACPU. (Change and notation when there has been a change in contents) • Items indicated as "New" have been newly added for High performance model QCPU/QnACPU.
Corresponding CPU	• Indicates the corresponding CPU type name. ○+Rem: Can be applied to all CPU types and MELSECNET/H remote I/O modules. ○: Can be applied to all types of CPU - QCPU: Can be applied to Q-series CPU - QnA: Can be applied to QnA series and Q2ASCPU series - Remote: Can be applied to the MELSECNET/H remote I/O modules. - Each CPU type name: Can be applied only to the specific CPU. (e.g. Q4ARCPU, Q3ACPU)

For details on the following items, see these manuals:

- Networks → • Far Q MELSECNET/H Network System Reference Manual (PLC to PLC network)
 - Far Q MELSECNET/H Network System Reference Manual (Remote I/O network)
 - MELSECNET/10 Network System Reference Manual for QnA/Q4AR
- SFC → QCPU(Q Mode)/QnACPU Programming Manual (SFC)

POINT

- (1) SM1200 to SM1255 are used for QnACPU.
These relays are vacant with QCPU.
- (2) Special relays SM1500 and later are dedicated for Q4ARCPU.

Special Relay List

(1) Diagnostic Information

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM0	Diagnostic errors	OFF: No error ON : Error	- ON if diagnosis results show error occurrence (Includes external diagnosis) - Stays ON subsequently even if normal operations restored	S (Error)	New	○+Rem
SM1	Self-diagnostic error	OFF: No self-diagnosis errors ON : Self-diagnosis	- Comes ON when an error occurs as a result of self-diagnosis. - Stays ON subsequently even if normal operations restored	S (Error)	M9008	
SM5	Error common information	OFF: No error common information ON : Error common information	When SM0 is ON, ON if there is error common information	S (Error)	New	
SM16	Error individual information	OFF: No error common information ON : Error common information	When SM0 is ON, ON if there is error individual information	S (Error)	New	
SM50	Error reset	OFF → ON : Error reset	- Conducts error reset operation - See section 11.3 for further information	U	New	
SM51	Battery low latch	OFF: Normal ON : Battery low	- ON if battery voltage at CPU or memory card drops below rated value. - Stays ON subsequently even after normal operation is restored - Synchronous with BAT. ALARM LED	S (Error)	M9007	○
SM52	Battery low	OFF: Normal ON : Battery low	Same as SM51, but goes OFF subsequently when battery voltage returns to normal.	S (Error)	M9006	
SM53	AC/DC DOWN detection	OFF: AC/DC DOWN not detected ON : AC/DC DOWN detected	Comes ON if a momentary power interruption of less than 20ms occurred during use of the AC power supply module, and reset by turning the power OFF, then ON.	S (Error)	M9005	QCPU
			Comes ON if a momentary power interruption of less than 10ms occurred during use of the DC power supply module, and reset by turning power OFF, then ON.			QnA
			Comes ON if a momentary power interruption of less than 1ms occurred during use of the DC power supply module, and reset by turning power OFF, then ON.			
SM54	MINI link errors	OFF: Normal ON : Error	- Goes ON if MINI (S3) link error is detected at even one of the installed AJ71PT32 (S3) modules. - Stays ON subsequently even after normal operation is restored.	S (Error)	M9004	QnA
SM56	Operation Errors	OFF: Normal ON : Operation error	- ON when operation error is generated - Stays ON subsequently even if normal operations restored	S (Error)	M9011	○
SM60	Blown fuse detection	OFF: Normal ON : Module with blown fuse	- Comes ON even if there is only one output module with a blown fuse, and remains ON even after return to normal - Blown fuse state is checked even for remote I/O station output modules.	S (Error)	M9000	○+Rem
SM61	I/O module verification error	OFF: Normal ON : Error	- Comes ON if there is a discrepancy between the actual I/O modules and the registered information when the power is turned on - I/O module verification is also conducted for remote I/O station modules.	S (Error)	M9002	
SM62	Annunciator detection	OFF: Not detected ON : Detected	Goes ON if even one annunciator F goes ON.	S (Instruction execution)	M9009	
SM80	CHK detection	OFF: Not detected ON : Detected	- Goes ON if error is detected by CHK instruction. - Stays ON subsequently even after normal operation is restored.	S (Instruction execution)	New	
SM90	Startup of watchdog timer for step transition (Enabled only when SFC program exists)	OFF: Not started (watchdog timer reset) ON : Started (watchdog timer started)	Corresponds to SD90	U	M9108	○
SM91			Corresponds to SD91		M9109	
SM92			Corresponds to SD92		M9110	
SM93			Corresponds to SD93		M9111	
SM94			Corresponds to SD94		M9112	
SM95			Corresponds to SD95		M9113	
SM96			Corresponds to SD96		M9114	
SM97			Corresponds to SD97		New	
SM98			Corresponds to SD98		New	
SM99			Corresponds to SD99		New	

Special Relay List

(2) System information

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM202	LED off command	OFF → ON : LED off	• At change from OFF to ON, the LEDs corresponding to the individual bits at SD202 go off	U	New	○
SM203	STOP contact	STOP state	• Goes ON at STOP state	S (Status change)	M9042	
SM204	PAUSE contact	PAUSE state	• Goes ON at PAUSE state	S (Status change)	M9041	
SM205	STEP-RUN contact	STEP-RUN state	• Goes ON at STEP-RUN state	S (Status change)	M9054	
SM206	PAUSE enable coil	OFF : PAUSE disabled ON : PAUSE enabled	• PAUSE state is entered if this relay is ON when the remote PAUSE contact goes ON	U	M9040	Remote
	Device test request acceptance status	OFF : Device test not yet executed ON : Device test executed	• Comes ON when the device test mode is executed on GX Developer.	S (Request)	New	
SM210	Clock data set request	OFF : Ignored ON : Set request	• When this relay goes from OFF to ON, clock data being stored from SD210 through SD213 after execution of END instruction for changed scan is written to the clock device.	U	M9025	○
SM211	Clock data error	OFF : No error ON : Error	• ON when error is generated in clock data (SD210 through SD213) value, and OFF if no error is detected.	S (Request)	M9026	
SM212	Clock data display	OFF : Ignored ON : Display	• Displays clock data as month, day, hour, minute, and second at the LED display at front of CPU. (Enabled only for Q3ACPU and Q4ACPU)	U	M9027	Q3A Q4A Q4AR
SM213	Clock data read request	OFF : Ignored ON : Read request	• When this relay is ON, clock data is read to SD210 through SD213 as BCD values.	U	M9028	○+Rem
SM240	No. 1 CPU reset flag	OFF : PLC No. 1 reset cancel ON : PLC No. 1 resetting	• Goes OFF when reset of the PLC No. 1 is canceled. • Comes ON when the PLC No. 1 is resetting (including the case where the PLC is removed from the base). The other PLCs are also put in reset status.	S (Status change)	New	QCPU function Ver. B
SM241	No. 2 CPU reset flag	OFF : PLC No. 2 reset cancel ON : PLC No. 2 resetting	• Goes OFF when reset of the PLC No. 2 is canceled. • Comes ON when the PLC No. 2 is resetting (including the case where the PLC is removed from the base). The other PLCs result in "MULTI CPU DOWN" (error code: 7000).			
SM242	No. 3 CPU reset flag	OFF : PLC No. 3 reset cancel ON : PLC No. 3 resetting	• Goes OFF when reset of the PLC No. 3 is canceled. • Comes ON when the PLC No. 3 is resetting (including the case where the PLC is removed from the base). The other PLCs result in "MULTI CPU DOWN" (error code: 7000).			
SM243	No. 4 CPU reset flag	OFF : PLC No. 4 reset cancel ON : PLC No. 4 resetting	• Goes OFF when reset of the PLC No. 4 is canceled. • Comes ON when the PLC No. 4 is resetting (including the case where the PLC is removed from the base). The other PLCs result in "MULTI CPU DOWN" (error code: 7000).			
SM244	No. 1 CPU error flag	OFF : PLC No. 1 normal ON : PLC No. 1 during stop error	• Goes OFF when the PLC No. 1 is normal (including a continuation error). • Comes ON when the PLC No. 1 is during a stop error.			
SM245	No. 2 CPU error flag	OFF : PLC No. 2 normal ON : PLC No. 2 during stop error	• Goes OFF when the PLC No. 2 is normal (including a continuation error). • Comes ON when the PLC No. 2 is during a stop error.			
SM246	No. 3 CPU error flag	OFF : PLC No. 3 normal ON : PLC No. 3 during stop error	• Goes OFF when the PLC No. 3 is normal (including a continuation error). • Comes ON when the PLC No. 3 is during a stop error.			
SM247	No. 4 CPU error flag	OFF : PLC No. 4 normal ON : PLC No. 4 during stop error	• Goes OFF when the PLC No. 4 is normal (including a continuation error). • Comes ON when the PLC No. 4 is during a stop error.			

Special Relay List (Continued)

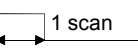
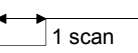
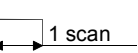
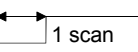
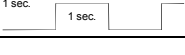
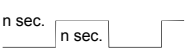
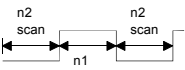
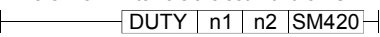
Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM250	Max. loaded I/O read	OFF: Ignored ON : Read	• When this relay goes from OFF to ON, maximum loaded I/O number is read to SD250.	U	New	○+Rem
SM251	I/O change flag	OFF: No replacement ON : Replacement	• After the head I/O number of the I/O module being replaced is set in SD251 is set, on-line I/O module replacement is enabled when this relay is ON. (Only one module can be replaced at each setting.) • To replace an I/O module in the RUN state, use the program or a peripheral device to turn this relay ON; to replace an I/O module in the STOP state, turn this relay ON in the test mode of a peripheral device. • Do not switch between RUN and STOP states until I/O module replacement is completed.	U (END)	M9094	Q2A (S1) Q3A Q4A Q4AR
SM252	I/O change OK	OFF: Replacement prohibited ON : Replacement enabled	• Goes ON when I/O replacement is OK.	S (END)	New	
SM254	All stations refresh command	OFF: Refresh arrival station ON : Refresh all stations	• Effective for the batch refresh (also effective for the low-speed cyclic) • Designate whether to receive arrival stations only or to receive all slave stations.	U (Every END)	New	QCPU
SM255	MELSECNET/10 module 1 information	OFF: Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	○
SM256		OFF: Reads ON : Does not read	• For refresh from link to CPU (B, W, etc.) indicate whether to read from the link module.	U	New	
SM257		OFF: Writes ON : Does not write	• For refresh from CPU to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM260	MELSECNET/10 module 2 information	OFF: Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM261		OFF: Reads ON : Does not read	• For refresh from link to CPU (B, W, etc.) indicate whether to read from the link module.	U	New	
SM262		OFF: Writes ON : Does not write	• For refresh from CPU to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM265	MELSECNET/10 module 3 information	OFF: Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM266		OFF: Reads ON : Does not read	• For refresh from link to CPU (B, W, etc.) indicate whether to read from the link module.	U	New	
SM267		OFF: Writes ON : Does not write	• For refresh from CPU to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM270	MELSECNET/10 module 4 information	OFF: Operative network ON : Standby network	• Goes ON for standby network (If no designation has been made concerning active or standby, active is assumed.)	S (Initial)	New	
SM271		OFF: Reads ON : Does not read	• For refresh from link to CPU (B, W, etc.) indicate whether to read from the link module.	U	New	
SM272		OFF: Writes ON : Does not write	• For refresh from CPU to link (B, W, etc.), designate whether to write to the link module.	U	New	
SM280	CC-Link error	OFF: Normal ON : Error	• Goes ON when a CC-Link error is detected in any of the installed QJ61QBT11. Goes OFF when normal operation is restored.	S (Status change)	New	QCPU Remote
			• Goes ON when a CC-Link error is detected in any of the installed A(1S)J61QBT11. Stays ON even after normal operation is restored.	S (Error)	New	QnA
SM320	Presence/absence of SFC program	OFF: SFC program absent ON : SFC program present	• ON if SFC program is correctly registered, and OFF if not registered. • Goes OFF if SFC dedicated instruction is not correct.	S (Initial)	M9100	
SM321	Start/stop SFC program	OFF: SFC program stop ON : SFC program start	• Initial value is set at the same value as SM320. (Goes ON automatically if SFC program is present.) • SFC program will not execute if this goes OFF prior to SFC program processing • Subsequently, starts SFC program when this goes from OFF to ON. • Subsequently, stops SFC program when this goes from ON to OFF.	S (Initial) U	M9101 format change	○

Special Relay List (Continued)

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM322	SFC program start state	OFF: Initial start ON : Restart	- Initial value is set at ON or OFF depending on parameters. - When OFF, all execution states are cleared from time SFC program was stopped; starts from the initial step of block where the start request was made. - When ON, starts from execution block and execution step active at time SFC program was stopped. (ON is enabled only when resumptive start has been designated at parameters.) - SM902 is not automatically designated for latch.	S (Initial) U	M9102 format change	○
SM323	Presence/absence of continuous transition for entire block	OFF: Continuous transition not effective ON : Continuous transition effective	- When OFF, transition occurs at one scan/one step, for all blocks. - When ON, transition occurs continuously for all blocks in one scan. - In designation of individual blocks, priority is given to the continuous transition bit of the block. (Designation is checked when block starts.)	U	M9103	
SM324	Continuous transition prevention flag	OFF: When transition is executed ON : When no transition	- When continuous transition is effective, goes ON when continuous transition is not being executed; goes OFF when continuous transition is being executed. - Normally ON when continuous transition is not effective.	S (Instruction execution)	M9104	
SM325	Output mode at block stop	OFF: OFF ON : Preserves	- When block stops, selects active step operation output. - All coil outputs go OFF when OFF. - Coil outputs are preserved when ON.	S (Initial) U	M9196	
SM326	SFC device clear mode	OFF: Clear device ON : Preserves device	Selects the device status when the stopped CPU is run after the sequence program or SFC program has been modified when the SFC program exists.	U	New	
SM327	Output during end step execution	OFF: OFF ON : Preserves	- Selects the output action of the step being held when a block is ended by executing the end step. - All coil outputs go OFF when OFF. - Coil outputs are preserved when ON.	S (Initial) U	New	
SM330	Operation mode for low-speed execution type program	OFF: Asynchronous mode ON : Synchronous mode	- Asynchronous mode Mode where the operations for the low-speed execution type program are continued during the excess time. - Synchronous mode Mode where the operations for the low-speed execution type program are started from the next scan even when there is the excess time.	U (END)	New	

Special Relay List

(3) System clocks/counters

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU	
SM400	Always ON	ON _____ OFF	• Normally is ON	S (Every END processing)	M9036	○	
SM401	Always OFF	ON _____ OFF	• Normally is OFF	S (Every END processing)	M9037		
SM402	ON for 1 scan only after RUN	ON  OFF	• After RUN, ON for 1 scan only. • This connection can be used for scan execution type programs only.	S (Every END processing)	M9038		
SM403	After RUN, OFF for 1 scan only	ON  OFF	• After RUN, OFF for 1 scan only. • This connection can be used for scan execution type programs only.	S (Every END processing)	M9039		
SM404	Low-speed execution type program ON for 1 scan only after RUN	ON  OFF	• After RUN, ON for 1 scan only. • This connection can be used for low-speed execution type programs only.	S (Every END processing)	New		
SM405	Low-speed execution type program After RUN, OFF for 1 scan only	ON  OFF	• After RUN, OFF for 1 scan only. • This connection can be used for low-speed execution type programs only.	S (Every END processing)	New	○	
SM409	0.01 second clock		• Repeatedly changes between ON and OFF at 5-ms interval. • When power supply is turned OFF or a reset is performed, goes from OFF to start. • Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.	S (Status change)	New		QCPU
SM410	0.1 second clock		• Repeatedly changes between ON and OFF at each designated time interval. • When power supply is turned OFF, or reset is performed, goes from OFF to start. • Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.	S (Status change)	M9030		○
SM411	0.2 second clock				M9031		
SM412	1 second clock				M9032		
SM413	2 second clock				M9033		
SM414	2n second clock		• Goes between ON and OFF in accordance with the number of seconds designated by SD414. • When power supply is turned OFF, or reset is performed, goes from OFF to start. • Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.	S (Status change)	M9034 format change	QCPU	
SM415	2n (ms) clock		• Switches between ON and OFF in accordance with the number of milliseconds designated by SD415. • When power supply is turned OFF, or reset is performed, goes from OFF to start. • Note that the ON-OFF status changes when the designated time has elapsed during the execution of the program.	S (Status change)	New		
SM420	User timing clock No.0		• Relay repeats ON/OFF switching at fixed scan intervals. • When power supply is turned ON, or reset is performed, goes from OFF to start. • The ON/OFF intervals are set with the DUTY instruction. 	S (Every END processing)	M9020	○	
SM421	User timing clock No.1				M9021		
SM422	User timing clock No.2				M9022		
SM423	User timing clock No.3				M9023		
SM424	User timing clock No.4				M9024		
SM430	User timing clock No.5		• For use with SM420 through SM424 low speed programs.	S (Every END processing)	New		
SM431	User timing clock No.6						
SM432	User timing clock No.7						
SM433	User timing clock No.8						
SM434	User timing clock No.9						

Special Relay List

(4) Scan information

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM510	Low speed program execution flag	OFF: Completed or not executed ON : Execution under way.	• Goes ON when low-speed execution type program is executed.	S (Every END processing)	New	○
SM551	Reads module service interval	OFF: Ignored ON : Read	• When this goes from OFF to ON, the module service interval designated by SD550 is read to SD551 through 552.	U	New	○+Rem

(5) Memory cards

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM600	Memory card A usable flags	OFF: Unusable ON : Use enabled	• ON when memory card A is ready for use by user	S (Initial)	New	○
SM601	Memory card A protect flag	OFF: No protect ON : Protect	• Goes ON when memory card A protect switch is ON	S (Initial)	New	
SM602	Drive 1 flag	OFF: No drive 1 ON : Drive 1 present	• Goes ON when drive 1 (card 1 RAM area) is present	S (Initial)	New	
SM603	Drive 2 flag	OFF: No drive 2 ON : Drive 2 present	• Goes ON when drive 2 (card 1 ROM area) is present	S (Initial)	New	
SM604	Memory card A in-use flag	OFF: Not in use ON : In use	• Goes ON when memory card A is in use	S (Initial)	New	
SM605	Memory card A remove/insert prohibit flag	OFF: Remove/insert enabled ON : Remove/insert prohibited	• Goes ON when memory card A cannot be inserted or removed	U	New	
SM609	Memory card remove/insert enable flag	OFF: Remove/insert prohibited ON : Remove/insert enabled	• Turned ON by user to enable the removal/insertion of memory card. • Turned OFF by the system after the card is removed.	U/S	New	
SM620	Memory card B usable flags	OFF: Unusable ON : Use enabled	• Always ON	S (Initial)	New	QCPU
			• ON when memory card B is ready for use by user	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR
SM621	Memory card B protect flag	OFF: No protect ON : Protect	• Always ON	S (Initial)	New	QCPU
			• Goes ON when memory card B protect switch is ON	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR
SM622	Drive 3 flag	OFF: No drive 3 ON : Drive 3 present	• Always ON	S (Initial)	New	QCPU
			• Goes ON when drive 3 (card 2 RAM area) is present	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR
SM623	Drive 4 flag	OFF: No drive 4 ON : Drive 4 present	• Always ON • Goes ON when drive 4 (card 2 ROM area) is present	S (Initial) S (Initial)	New New	Q2A (S1) Q3A Q4A Q4AR
SM624	Memory card B in-use flag	OFF: Not in use ON : In use	• Goes ON when memory card B is in use	S (Initial)	New	
SM625	Memory card B remove/insert prohibit flag	OFF: Remove/insert enabled ON : Remove/insert prohibited	• Goes ON when memory card B cannot be inserted or removed	U	New	
SM640	File register use	OFF: File register not in use ON : File register in use	• Goes ON when file register is in use	S (Status change)	New	○
SM650	Comment use	OFF: File register not in use ON : File register in use	• Goes ON when comment file is in use	S (Status change)	New	
SM660	Boot operation	OFF: Internal memory execution ON : Boot operation in progress	• Goes ON while boot operation is in process • Goes OFF if boot designation switch is OFF	S (Status change)	New	
SM672	Memory card A file register access range flag	OFF: Within access range ON : Outside access range	• Goes ON when access is made to area outside the range of file register R of memory card A (Set within END processing.) • Reset at user program	S/U	New	

Special Relay List (Continued)

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM673	Memory card B file register access range flag	OFF: Within access range ON : Outside access range	- Goes ON when access is made outside the range of file registers, R. of memory card B. (Set within END processing.) - Reset at user program	S/U	New	Q2A (S1) Q3A Q4A Q4AR

(6) Instruction-Related Special Relays

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM700	Carry flag	OFF: Carry OFF ON : Carry ON	Carry flag used in application instruction	S (Instruction execution)	M9012	○
SM701	Number of output characters selection	OFF: 16 characters output ON : Outputs until NUL	- When SM701 is OFF, 16 characters of ASCII code are output. - When SM701 is ON, output conducted until NUL (00H) code is encountered.	U	M9049	
SM702	Search method	OFF: Search next ON : 2-part search	- Designates method to be used by search instruction. - Data must be arranged for 2-part search.	U	New	
SM703	Sort order	OFF: Ascending order ON : Descending order	The sort instruction is used to designate whether data should be sorted in ascending order or in descending order.	U	New	
SM704	Block comparison	OFF: Non-match found ON : All match	Goes ON when all data conditions have been met for the BKCOMP instruction.	S (Instruction execution)	New	
SM707	Selection of real number instruction processing type	OFF: Speed oriented ON : Accuracy oriented	- When SM707 is OFF, real number instructions are processed at high speed. - When it is ON, real number instructions are processed with high accuracy.	U	New	Q4AR
SM710	CHK instruction priority ranking flag	OFF: Conditions priority ON : Pattern priority	- Remains as originally set when OFF. - CHK priorities updated when ON.	S (Instruction execution)	New	○
SM711	Divided transmission status	OFF: Other than during divided processing ON : During divided processing	In processing of AD57(S1), goes ON when screen is split for transfer, and goes OFF when split processing is completed	S (Instruction execution)	M9065	QnA
SM712	Transmission processing selection	OFF: Batch transmission ON : Divided transmission	In processing of AD57(S1), goes ON when canvas screen is divided for transfer.	S (Instruction execution)	M9066	
SM714	Communication request registration area BUSY signal	OFF: Communication request to remote terminal module enabled ON : Communication request to remote terminal module disabled	Used to determine whether communications requests to remote terminal modules connected to the AJ71PT32-S3 can be executed or not.	S (Instruction execution)	M9081	
SM715	EI flag	0 : During DI 1 : During EI	ON when EI instruction is being executed.	S (Instruction execution)	New	○
SM720	Comment read completion flag	OFF: Comment read not completed ON : Comment read completed	Switches ON for only one scan when COMRD or PRC instruction is completed.	S (Status change)	New	QCPU
SM721	File being accessed	OFF: File not accessed ON : File being accessed	Switches ON while a file is being accessed by the S.FWRITE, S.FREAD, COMRD, PRC, or LEDC instruction.	S (Status change)	New	
SM722	BIN/DBIN instruction error disabling flag	OFF: Error detection performed ON : Error detection not performed	Turned ON when "OPERATION ERROR" is suppressed for BIN or DBIN instruction.	U	New	
SM730	BUSY signal for CC-Link communication request registration area	OFF: Request for communication with intelligent device station enabled ON : Request for communication with intelligent device station disabled	Used for determination whether to enable or disable the communication request for the intelligent device station connected with A(1S)J61QBT11.	S (Instruction execution)	New	QnA

Special Relay List (Continued)

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM736	PKEY instruction execution in progress flag	OFF: Instruction not executed ON : Instruction execution	• ON when PKEY instruction is being executed. Goes OFF when CR is input, or when input character string reaches 32 characters.	S (Instruction execution)	New	○
SM737	Keyboard input reception flag for PKEY instruction	OFF: Keyboard input reception enabled ON : Keyboard input reception disabled	• Goes ON when keyboard input is being conducted. Goes when keyboard input has been stored at the CPU.	S (Instruction execution)	New	
SM738	MSG instruction reception flag	OFF: Instruction not executed ON : Instruction execution	• Goes ON when MSG instruction is executed.	S (Instruction execution)	New	
SM774	PID bumpless processing	OFF: Forces match ON : Does not force match	• In manual mode, designates whether or not to force the SV value to match the PV value.	U	New	
SM775	Selection of link refresh processing during COM instruction execution	OFF: Performs link refresh ON : No link refresh performed	• Selects whether only the general data process is performed for the execution of the COM instruction or the link refresh process is also performed.	U	New	
SM776	Enable/disable local device at CALL	OFF: Local device disabled ON : Local device enabled	• Determines whether to enable/disable the local device in the program CALLED at CALL.	U (Status change)	New	
SM777	Enable/disable local device in interrupt program	OFF: Local device disabled ON : Local device enabled	• Determines whether to enable/disable the local device at the execution of interrupt programs.	U (Status change)	New	QnA
SM780	CC-Link dedicated instruction executable	OFF: CC-Link dedicated instruction executable ON : CC-Link dedicated instruction not executable	• Switches ON when the number of the CC-Link dedicated instructions that can be executed simultaneously reaches 32. Switches OFF when the number goes below 32.	U (Status change)	New	

(7) Debug

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM800	Trace preparation	OFF: Not prepared	• Switches ON when the trace preparation is completed.	S (Status change)	New	QCPU
	Sampling trace preparation	ON : Ready	• Goes ON when sampling trace is ready	S (Status change)	New	QnA
SM801	Trace start	OFF: Suspend ON : Start	• Trace is started when this relay switches ON. • Trace is suspended when this relay switches OFF. (All related special Ms switches OFF.)	U	M9047	QCPU
	Sampling trace start		• Sampling trace started when this goes ON • Suspended when OFF (Related special M all OFF)	U	M9047	QnA
SM802	Trace execution in progress	OFF: Suspend ON : Start	• Switches ON during execution of trace.	S (Status change)	M9046	QCPU
	Sampling trace execution in progress		• Goes ON during execution of sampling trace	S (Status change)	M9046	QnA
SM803	Trace trigger	OFF → ON: Start	• Trace is triggered when this relay switches from OFF to ON. (Identical to TRACE instruction execution state)	U	M9044	QCPU
	Sampling trace trigger		• Sampling trace trigger goes ON when this goes from OFF to ON (Identical to STRA instruction execution state)	U	M9044	QnA
SM804	After trace trigger	OFF: Not after trigger	• Switches ON after trace is triggered.	S (Status change)	New	QCPU
	After sampling trace trigger	ON : After trigger	• Goes ON after sampling trace trigger	S (Status change)	New	QnA
SM805	Trace completed	OFF: Not completed	• Switches ON at completion of trace.	S (Status change)	9043	QCPU
	Sampling trace completed	ON : End	• Goes ON at completion of sampling trace	S (Status change)	9043	QnA
SM806	Status latch preparation	OFF: Not prepared ON : Ready	• Goes ON when status latch is ready	S (Status change)	New	QnA
SM807	Status latch command	OFF → ON: Latch	• Runs status latch command	U	New	
SM808	Status latch completion	OFF: Latch not completed ON : Latch completed	• Comes ON when status latch is completed.	S (Status change)	9055	
SM809	Status latch clear	OFF → ON: Clear	• Enable next status latch	U	New	

Special Relay List (Continued)

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM810	Program trace preparation	OFF: Not ready ON : Ready	• Goes ON when program trace is ready	S (Status change)	New	QnA
SM811	Start program trace	OFF: Suspend ON : Start	• Program trace started when this goes ON • Suspended when OFF (Related special M all OFF)	S (Status change)	New	
SM812	Program trace execution under way	OFF: Suspend ON : Start	• ON when program trace execution is underway	U	New	
SM813	Program trace trigger	OFF → ON: Start	• Program trace trigger goes ON when this goes from OFF to ON (Identical to PTR instruction execution status)	S (Status change)	New	
SM814	After program trace trigger	OFF: Not after trigger ON : After trigger	• Goes ON after program trace trigger	S (Status change)	New	
SM815	Program trace completion	OFF: Not completed ON : End	• Goes ON at completion of program trace	S (Status change)	New	
SM820	Step trace preparation	OFF: Not prepared ON : Ready	• Goes ON after program trace registration, at ready.	U	New	○
SM821	Step trace starts	OFF: Suspend ON : Start	• When this goes ON, step trace is started • Suspended when OFF (Related special M all OFF)	S (Status change)	M9182 format change	
SM822	Step trace execution underway	OFF: Suspend ON : Start	• Goes ON when step trace execution is underway • Goes OFF at completion or suspension	S (Status change)	M9181	
SM823	After step trace trigger	OFF: Not after trigger ON : Is after first trigger	• Goes ON if even 1 block within the step trace being executed is triggered. • Goes OFF when step trace is commenced.	S (Status change)	New	
SM824	Step trace After trigger	OFF: Is not after all triggers ON : Is after all triggers	• Goes ON if all blocks within the step trace being executed are triggered. • Goes OFF when step trace is commenced.	S (Status change)	New	
SM825	Step trace completed	OFF: Not completed ON : End	• Goes ON at step trace completion. • Goes OFF when step trace is commenced.	S (Status change)	M9180	
SM826	Trace error	OFF: Normal	• Switches ON if error occurs during execution of trace.	S (Status change)	New	QCPU
	Sampling trace error	ON : Errors	• Goes ON if error occurs during execution of sampling trace.	S (Status change)	New	QnA
SM827	Status latch error	OFF: Normal ON : Errors	• Goes ON if error occurs during execution of status latch.	S (Status change)	New	
SM828	Program trace error	OFF: Normal ON : Errors	• Goes ON if error occurs during execution of program trace.	S (Status change)	New	

(8) Latch area

Number	Name	Meaning	Explanation	Set by (When Set)	Corresponding ACPU M9 ☐ ☐ ☐	Applicable CPU
SM900	Power cut file	OFF: No power cut file ON : Power cut file present	• Goes ON if a file is present during access when power is interrupted.	S/U (Status change)	New	QnA
SM910	RKEY registration flag	OFF: Keyboard input not registered ON : Keyboard input registered	• Goes ON at registration of keyboard input. OFF if keyboard input is not registered.	S (Instruction execution)	New	

(9) A to Q/QnA conversion correspondences

Special relays SM1000 to SM1255 are the relays which correspond to ACPU special relays M9000 to M9255 after A to Q/QnA conversion.

All of these special relays are controlled by the system so that users cannot turn them ON/OFF in the program.

If users want to turn these relays ON/OFF, the program should be modified to use QCPU/QnACPU special relays.

For SM1084 and SM1200 through SM1255, however, if a user can turn ON/OFF some of special relays M9084 and M9200 through M9255 before conversion, the user can also turn ON/OFF the corresponding relays among SM1084 and SM1200 through SM1255 after the conversion.

For details on the ACPU special relays, see the user's manuals for the individual CPUs, and MELSECNET or MELSECNET/B Data Link System Reference Manuals.

POINT

The processing time may be longer when converted special relays are used with QCPU. Uncheck "A-series CPU compatibility setting" within the PC system setting in GPPW parameters when converted special relays are not used.

REMARK

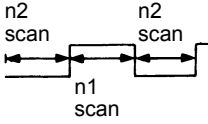
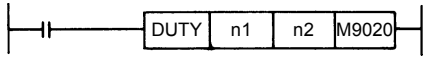
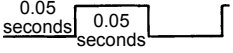
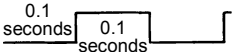
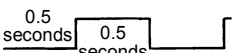
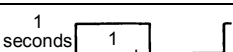
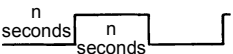
The following are additional explanations about the Special Relay for Modification column.

- ① When a special relay for modification is provided, the device number should be changed to the provided QCPU/QnACPU special relay.
- ② When ☐ is provided, the converted special relay can be used for the device number.
- ③ When ☒ is provided, the device number does not work with QCPU/QnACPU.

Special Relay List

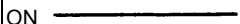
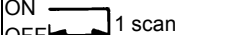
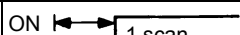
ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9000	SM1000	—	Fuse blown	OFF: Normal ON : Fuse blown module with blown fuse present	• Turned on when there is one or more output units of which fuse has been blown. Remains on if normal status is restored. Output modules of remote I/O stations are also checked for fuse condition.	○
M9002	SM1002	—	I/O module verification error	OFF: Normal ON : Error	• Turned on if the states of I/O module is different from entered states when power is turned on. Remains on if normal status is restored. I/O module verification is done also to remote I/O station modules. (Reset is enabled only when special registers SD1116 to SD1123 are reset.)	
M9004	SM1004	—	NIMI link error	OFF: Normal ON : Error	• Turned on when the MINI(S3) link error is detected on even one of the AJ71PT32(S3) modules being loaded. Remains on if normal status is restored.	QnA
M9005	SM1005	—	AC DOWN detection	OFF: AC DOWN not detected ON : AC DOWN detected	• Comes ON if a momentary power interruption of less than 20ms occurred during use of the AC power supply module, and reset by turning power OFF, then ON.	○
					• Comes ON if a momentary power interruption of less than 10ms occurred during use of the DC power supply module, and reset by turning power OFF, then ON.	
					• Comes ON if a momentary power interruption of less than 1ms occurred during use of the DC power supply module, and reset by turning power OFF, then ON.	QnA

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9006	SM1006	—	Battery low	OFF: Normal ON : Battery low	• Turned on when battery voltage reduces to less than specified.Turned off when battery voltage becomes normal.	○
M9007	SM1007	—	Battery low latch	OFF: Normal ON : Battery low	• Turned on when battery voltage reduces to less than specified.Remains on if battery voltage becomes normal.	
M9008	SM1008	SM1	Self-diagnostic error	OFF: No error ON : Error	• Turned on when error is found as a result of self-diagnosis.	
M9009	SM1009	SM62	Annunciator detection	OFF: No F number detected ON : F number detected	• Turned on when [OUT] F of [SET] F instruction is executed.Switched off when SD1124 data is zeroed.	○
M9011	SM1011	SM56	Operation error flag	OFF: No error ON : Error	• Turned on when operation error occurs during execution of application instruction.Remains on if normal status is restored.	
M9012	SM1012	SM700	Carry flag	OFF: Carry OFF ON : Carry ON	• Carry flag used in application instruction.	
M9016	SM1016		Data memory clear flag	OFF: Ignored ON : Output claired	• Clears the data memory including the latch range (other than special relays and special registers) in remote run mode from computer,etc.when SM1016 is on.	
M9017	SM1017		Data memory clear flag	OFF: Ignored ON : Output claired	• Clears the unlatched data memory (other than special relays and registers) in remote run mode from computer,etc.shen SM1017 is on.	
M9020	SM1020	—	User timing clock No.0		• Relay which repeats on/off at intervals of predetermined scan. • When power is turned on or reset is per-formed, the clock starts with off. • Set the intervals of on/off by [DUTY] instruction. 	
M9021	SM1021	—	User timing clock No.1			
M9022	SM1022	—	User timing clock No.2			
M9023	SM1023	—	User timing clock No.3			
M9024	SM1024	—	User timing clock No.4			
M9025	SM1025	—	Clock data set request	OFF: Ignored ON : Set request present used	• Writes clock data from SD1025 to SD1028 to the clock element after the [END] instruction is executed during the scan in which SM1025 has changed from off to on.	
M9026	SM1026	—	Clock data error	OFF: No error ON : Error	• Switched on by clock data (SD1025 to SD1028) error	
M9027	SM1027	—	Clock data display	OFF: Ignored ON : Display	• Clock data is read from SD1025 to SD1028 and month, day, hour, minute and minute are indicated on the CPU front LED display.	
M9028	SM1028	—	Clock data read request	OFF: Ignored ON : Read request	• Reads clock data to SD1025 to SD1028 in BCD when SD1028 is on.	
M9029	SM1029		Batch processing of data communications requests	OFF: Batch processing not conducted ON : Batch processing conducted	• The SM1029 relay is turned on using a sequence program to process all data communication requests accepted during one scan in the END processing of that scan. • The batch processing of the data communication requests can be turned on and off during running. • The default is OFF (processed one at a time for each END processing in the order in which data communication requests are accepted).	
M9030	SM1030	—	0.1 second clock		• 0.1 second, 0.2 second, 1 second and 2 second, clocks are generated. • Not turned on or off per scan but turned on and off even during scan if corresponding time has elapsed. • Starts with off when power is turned on or reset is performed.	
M9031	SM1031	—	0.2 second clock			
M9032	SM1032	—	1 second clock			
M9033	SM1033	—	2 second clock			
M9034	SM1034	—	2n minute clock (1 minute clock) *			

*: 1 minute clock indicates the name of the special relay (M9034) of the ACPU.

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9036	SM1036	—	Always ON	ON  OFF	• Used as dummy contacts of initialization and application instruction in sequence program. • SM1038 and SM1037 are turned on and off without regard to position of key switch on CPU front. SM1038 and SM1039 are under the same condition as RUN status except when the key switch is at STOP position, and turned off and on. Switched off if the key switch is in STOP position. SM1038 is on for one scan only and SM1039 is off for one scan only if the key switch is not in STOP position.	○
M9037	SM1037	—	Always OFF	ON  OFF		
M9038	SM1038	—	ON for 1 scan only after RUN	ON  OFF		
M9039	SM1039	—	RUN flag(After RUN, OFF for 1 scan only)	ON  OFF		
M9040	SM1040	SM206	PAUSE enable coil	OFF: PAUSE disabled ON : PAUSE enabled	• When RUN key switch is at PAUSE position or remote pause contact has turned on and if SM204 is on, PAUSE mode is set and SM206 is turned on.	
M9041	SM1041	SM204	USE statuscontact	OFF: PAUSE not in effect ON : PAUSE in effect		
M9042	SM1042	SM203	STOP status contact	OFF: STOP not in effect ON : STOP in effect	• Switched on when the RUN key switch is in STOP position.	
M9043	SM1043	SM805	SamplingTrace completed	OFF: Sampling trace in progress ON : Sampling trace completed	• Turned on upon completion of sampling trace performed the number of times preset by parameter after [STRA] instruction is executed. Reset when [STRAR] instruction is executed.	
M9044	SM1044	SM803	Sampling trace	OFF → ON [STRA] Same as execution ON → OFF [STRAR] Same as execution	• Turning on/off SM803 can execute [STRA] / [STRAR] instruction. (SM803 is forcibly turned on/off by a peripheral device.) When switched from OFF to ON: [STRA] instruction When switched from ON to OFF: [STRAR] instruction The value stored in SD1044 is used as the condition for the sampling trace. At scanning, at time → Time (10 msec unit)	
M9045	SM1045		Watchdog timer (WDT) reset	OFF: Does not reset WDT ON : Resets WDT	• The SM1015 relay is turned on to reset the WDT when the ZCOM instruction and data communication request batch processing are executed (used when the scan time exceeds 200 ms).	
M9046	SM1046	SM802	Sampling trace	OFF: Trace not in progress ON : Trace in progress	• Switched on during sampling trace.	
M9047	SM1047	SM801	Sampling trace preparations	OFF: Sampling trace suspended ON : Sampling trace started	• Sampling trace is not executed unless SM801 is turned ON. • Sampling trace is suspended when SM801 goes OFF.	
M9049	SM1049	SM701	Selection of number of characters output	OFF: Output until NULL code encountered ON : 16 characters output	• When SM701 is OFF, characters up to NUL (00H) code are output. • When SM701 is ON, ASCII codes of 16 characters are output.	
M9051	SM1051		CHG instruction execution disable	OFF: Enabled ON : Disable	• Switched ON to disable the CHG instruction. • Switched ON when program transfer is requested. Automatically switched OFF when transfer is complete.	
M9052	SM1052		SEG instruction switch	OFF: 7SEG segment display ON : I/O partial refresh	• When SM1052 is ON, the SEG instruction is executed as an I/O partial refresh instruction. • When SM1052 is OFF, the SEG instruction is executed as a 7-SEG display instruction.	
M9054	SM1054	SM205	STEP RUN flag	OFF: STEP RUN not in effect ON : STEP RUN in effect	• Switched on when the RUN key switch is in STEP RUN position.	QnA
M9055	SM1055	SM808	Status latch completion flag	OFF: Not completed ON : Completed	• Turned on when status latch is completed. Turned off by reset instruction.	
M9056	SM1056		Main side P, I set request	OFF: Other than when P, I set being requested ON : P, I set being requested	• Provides P, I set request after transfer of the other program (for example subprogram when main program is being run) is complete during run. Automatically switched off when P, I setting is complete.	○
M9057	SM1057		Sub side P, I set request	OFF: Other than when P, I set being requested ON : P, I set being requested		
M9058	SM1058		Main program P, I set completion	Momentarily ON at P, I set completion	• Turned ON once when the P, I set has been completed, and then turned OFF again.	
M9059	SM1059		Sub program P, I set completion	Momentarily ON at P, I set completion		
M9060	SM1060		Sub program 2 P, I set request	OFF: Other than when P, I set being requested ON : P, I set being requested	• Provides P, I set request after transfer of the other program (for example subprogram when main program is being run) is complete during run. Automatically switched off when P, I setting is complete.	

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9061	SM1061		Sub program 3 P, I set request	OFF: Other than when P, I set being requested ON : P, I set being requested	• Provides P, I set request after transfer of the other program (for example subprogram when main program is being run) is complete during run. Automatically switched off when P, I setting is complete.	○
M9065	SM1065	SM711	Divided processing execution detection	OFF: Divided processing not underway ON : During divided processing	• Turned on when canvas screen transfer to AD57(S1)/AD58 is done by divided processing, and turned off at completion of divided processing.	QnA
M9066	SM1066	SM712	Divided processing request flag	OFF: Batch processing ON : Divided processing	• Turned on when canvas screen transfer to AD57(S1)/AD58 is done by divided processing.	
M9070	SM1070		A8UPU/A8PUJ required search time	OFF: Read time not shortened ON : Read time shortened	• Turned ON to shorten the search time in the A8UPU/A8PUJ. (In this case, the scan time is extended by 10 %.) * The A8UPU/A8PUJ cannot be used in the QCPU/QnACPU special relays.	○
M9081	SM1081	SM714	Communication request registration area BUSY signal	OFF: Empty spaces in communication request registration area ON : No empty spaces in communication request registration area	• Indication of communication enable/disable to remote terminal modules connected to the AJ71PT32-S3, A2C or A52G.	QnA
M9084	SM1084		Error check	OFF: Error check executed ON : No error check	• It is set whether the error checks below are performed or not when the END instruction is processed (to set the END instruction processing time). • Check for breakage of fuse. • Collation check of I/O unit • Check of battery	○
M9091	SM1091		Instruction error flag	OFF: No error ON : Error	• Set when an operation error detail factor is stored at SD1091, and remains set after normal state is restored. • Set when an error occurred at execution of the microcomputer program package, and remains set after normal state is restored.	
M9094	SM1094	SM251	I/O change flag	OFF: Replacement ON : No replacement	• After the head address of the required I/O module is set to SD251, switching SM251 on allows the I/O module to be changed in online mode. (One module is only allowed to be changed by one setting.) • To be switched on in the program or peripheral device test mode to change the module during CPU RUN. To be switched on in peripheral device test mode to change the module during CPU STOP. • RUN/STOP mode must not be changed until I/O module change is complete.	QnA
M9100	SM1100	SM320	Presence/absence of SFC program	OFF: SFC programs not used ON : SFC programs used	• Turned on if the SFC program is registered, and turned off if it is not.	○
M9101	SM1101	SM321	Start/stop SFC program	OFF: SFC programs stop ON : SFC programs start	• Should be turned on by the program if the SFC program is to be started. If turned off, operation output of the execution step is turned off and the SFC program is stopped.	
M9102	SM1102	SM322	SFC program start state	OFF: Initial Start ON : Continue	• Selects the starting step when the SFC program is restarted using SM322. ON: All execution conditions when the SFC program stopped are cleared, and the program is started with the initial step of block 0. OFF: Started with the step of the block being executed when the program stopped. • Once turned on, the program is latched in the system and remains on even if the power is turned off. Should be turned off by the sequence program when turning on the power, or when starting with the initial step of block 0.	
M9103	SM1103	SM323	Presence/absence of continuous transition	OFF: Continuous transition not effective ON : Continuous transition effective	• Selects consecutive or step-by-step transfer of steps of which transfer conditions are established when all of the transfer conditions of consecutive steps are established. ON: Consecutive transfer is executed. OFF: One step per one scan is transferred.	

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning			Details	Applicable CPU
M9104	SM1104	SM324	Continuous transition suspension flag	OFF: When transition is completed ON : When no transition			• Set when consecutive transfer is not executed with consecutive transfer enabled. Reset when transfer of one step is completed. Consecutive transfer of a step can be prevented by writing an AND condition to corresponding M9104.	○
M9108	SM1108	SM90	Step transition watchdog timer start (equivalent of D9108)	OFF: Watchdog timer reset ON : Watchdog timer reset start			• Turned on when the step transfer monitoring timer is started. Turned off when the monitoring timer is reset.	
M9109	SM1109	SM91	Step transition watchdog timer start (equivalent of D9109)					
M9110	SM1110	SM92	Step transition watchdog timer start (equivalent of D9110)					
M9111	SM1111	SM93	Step transition watchdog timer start (equivalent of D9111)					
M9112	SM1112	SM94	Step transition watchdog timer start (equivalent of D9112)					
M9113	SM1113	SM95	Step transition watchdog timer start (equivalent of D9113)					
M9114	SM1114	SM96	Step transition watchdog timer start (equivalent of D9114)					
M9180	SM1180	SM825	Active step sampling trace completion flag	OFF: Trace started ON : Trace completed			• Set when sampling trace of all specified blocks is completed. Reset when sampling trace is started.	
M9181	SM1181	SM822	Active step sampling trace execution flag	OFF: Trace not being executed ON : Trace execution under way			• Set when sampling trace is being executed. Reset when sampling trace is completed or suspended.	
M9182	SM1182	SM821	Active step sampling trace permission	OFF: Trace disable/suspend ON : Trace enable			• Selects sampling trace execution enable/disable. ON: Sampling trace execution is enabled. OFF: Sampling trace execution is disabled. If turned off during sampling trace execution, trace is suspended.	
M9196	SM1196	SM325	Operation output at block stop	OFF: Coil output OFF ON : Coil output ON			• Selects the operation output when block stop is executed. ON: Retains the ON/OFF status of the coil being used by using operation output of the step being executed at block stop. OFF: All coil outputs are turned off. (Operation output by the SET instruction is retained regardless of the ON/OFF status of M9196.)	
M9197	SM1197		Switch between blown fuse and I/O verification error display	SM9197	SM1198	I/O numbers to be displayed	Switches I/O numbers in the fuse blow module storage registers (SD1100 to SD1107) and I/O module verify error storage registers (SD1116 to SD1123) according to the combination of ON/OFF of the SM1197 and SM1198.	
				OFF	OFF	X/Y 0 to 7F0		
				ON	OFF	X/Y 800 to FF0		
M9198	SM1198			OFF	ON	X/Y 1000 to 17F0		
			ON	ON	X/Y 1800 to 1FF0			
M9199	SM1199		Data recovery of online sampling trace/status latch	OFF: Data recovery disabled ON : Data recovery enabled			• Recovers the setting data stored in the CPU at restart when sampling trace/status latch is executed. • SM1199 should be ON to execute again. (Unnecessary when writing the data again from peripheral devices.)	

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9200	SM1200	—	[ZNRD] instruction (LRDP instruction for ACPU) reception (for master station)	OFF: Not accepted ON : Accepted	- Depends on whether or not the [ZNRD] (word device read) instruction has been received. - Used in the program as an interlock for the [ZNRD] instruction. - Use the [RST] instruction to reset.	QnA
M9201	SM1201	—	[ZNRD] instruction (LRDP instruction for ACPU) completion (for master station)	OFF: Not completed ON : End	- Depends on whether or not the [ZNRD] (word device read) instruction execution is complete. - Used as a condition contact for resetting M9200 and M9201 after the [ZNRD] instruction is complete. - Use the [RST] instruction to reset.	
M9202	SM1202	—	[ZNWR] instruction (LWTP instruction for ACPU) reception (for master station)	OFF: Not accepted ON : Accepted	- Depends on whether or not the [ZNWR] (word device write) instruction has been received. - Used in the program as an interlock for the [ZNWR] instruction. - Use the [RST] instruction to reset.	
M9203	SM1203	—	[ZNWR] instruction (LWTP instruction for ACPU) completion (for master station)	OFF: Not completed ON : End	- Depends on whether or not the [ZNWR] (word device write) instruction execution is complete. - Used as a condition contact to reset M9202 and M9203 after the [ZNWR] instruction is complete. - Use the [RST] instruction to reset.	
M9204	SM1204	—	[ZNRD] instruction (LWTP instruction for ACPU) reception (for local station)	OFF: Not completed ON : End	On indicates that the [ZNRD] instruction is complete at the local station.	
M9205	SM1205	—	[ZNWR] instruction (LRDP instruction for ACPU) reception (for local station)	OFF: Not completed ON : End	On indicates that the [ZNWR] instruction is complete at the local station.	
M9206	SM1206	—	Host station link parameter error	OFF: Normal ON : Abnormal	Depends on whether or not the link parameter setting of the host is valid.	
M9207	SM1207	—	Link parameter check results	OFF: YES ON : NO	Depends on whether or not the link parameter setting of the master station in tier two matches that of the master station in tier three in a three-tier system. (Valid only for the master stations in a three-tier system.)	
M9208	SM1208	—	Sets master station B and W transmission range (for lower link master stations only)	OFF: Transmits to tier2 and tier 3 ON : Transmits to tier2 only	- Depends on whether or not the B and W data controlled by higher-link master station (host station) is sent to lower-link local stations (tertiary stations). - When SM1208 is OFF.....B and W of host station is sent to tertiary stations. - When SM1208 is ON.....B and W of host station is not sent to tertiary stations.	
M9209	SM1209	—	Link parameter check command (for lower link master stations only)	OFF: Executing the check function ON : Check non-execution	- Set to ON not to match B and W of the higher and lower links. (When SM1209 is ON, the link parameters of the higher and lower links are not checked.) - When SM1209 is OFF, the link parameters of the higher and lower links are checked.	
M9210	SM1210	—	Link card error (for master station)	OFF: Normal ON : Abnormal	Depends on presence or absence of the link card hardware error. Judged by the CPU.	
M9211	SM1211	—	Link module error (for local station use)	OFF: Normal ON : Abnormal	Depends on presence or absence of the link card hardware error. Judged by the CPU.	
M9224	SM1224	—	Link state	OFF: Online ON : Offline, station-to-station test, or self-loopback test	Depends on whether the master station is online or offline or is in station-to-station test or self-loopback test mode.	
M9225	SM1225	—	Forward loop error	OFF: Normal ON : Abnormal	Depends on the error condition of the forward loop line.	
M9226	SM1226	—	Reverse loop error	OFF: Normal ON : Abnormal	Depends on the error condition of the reverse loop line.	
M9227	SM1227	—	Loop test state	OFF: Not being executed ON : Forward or reverse loop test execution underway	Depends on whether or not the master station is executing a forward or a reverse loop test.	
M9232	SM1232	—	Local station operation state	OFF: RUN or STEP RUN state ON : STOP or PAUSE state	Depends on whether or not a local station is in STOP or PAUSE mode.	

Special Relay List (Continued)

ACPU Special Relay	Special Relay after Conversion	Special Relay for Modification	Name	Meaning	Details	Applicable CPU
M9233	SM1233	—	Local station error detect state	OFF: No errors ON : Error detection	Depends on whether or not a local station has detected an error in another station.	QnA
M9235	SM1235	—	Local station, remote I/O station parameter error detect state	OFF: No errors ON : Error detection	Depends on whether or not a local or a remote I/O station has detected any link parameter error in the master station.	
M9236	SM1236	—	Local station, remote I/O station initial communications state	OFF: No communications ON : Communications underway	Depends on the results of initial communication between a local or remote I/O station and the master station. (Parameter communication, etc.)	
M9237	SM1237	—	Local station, remote I/O station error	OFF: Normal ON : Abnormal	Depends on the error condition of a local or remote I/O station.	
M9238	SM1238	—	Local station, remote I/O station forward or reverse loop error	OFF: Normal ON : Abnormal	Depends on the error condition of the forward and reverse loop lines of a local or a remote I/O station.	
M9240	SM1240	—	Link state	OFF: Online ON : Offline, station-to- station test, or self- loopback test	Depends on whether the local station is online or offline, or is in station-to-station test or self-loopback test mode.	
M9241	SM1241	—	Forward loop line error	OFF: Normal ON : Abnormal	Depends on the error condition of the forward loop line.	
M9242	SM1242	—	Reverse loop line error	OFF: Normal ON : Abnormal	Depends on the error condition of the reverse loop line.	
M9243	SM1243	—	Loopback implementation	OFF: Loopback not being conducted ON : Loopback implementation	Depends on whether or not loopback is occurring at the local station.	
M9246	SM1246	—	Data not received	OFF: Reception ON : No reception	Depends on whether or not data has been received from the master station.	
M9247	SM1247	—	Data not received	OFF: Reception ON : No reception	Depends on whether or not a tier three station has received data from its master station in a three-tier system.	
M9250	SM1250	—	Parameters not received	OFF: Reception ON : No reception	Depends on whether or not link parameters have been received from the master station.	
M9251	SM1251	—	Link relay	OFF: Normal ON : Abnormal	Depends on the data link condition at the local station.	
M9252	SM1252	—	Loop test state	OFF: Not being executed ON : Forward or reverse loop test execution underway	Depends on whether or not the local station is executing a forward or a reverse loop test.	
M9253	SM1253	—	Master station operation state	OFF: RUN or STEP RUN state ON : STOP or PAUSE state	Depends on whether or not the master station is in STOP or PAUSE mode.	
M9254	SM1254	—	Local station other than host station operation state	OFF: RUN or STEP RUN state ON : STOP or PAUSE state	Depends on whether or not a local station other than the host is in STOP or PAUSE mode.	
M9255	SM1255	—	Local station other than host station error	OFF: Normal ON : Abnormal	Depends on whether or not a local station other than the host is in error.	

Special Relay List

(10) For redundant systems (Host system CPU information *1) for Q4AR only

SM1510 to SM1599 are only valid for redundant systems. All off for standalone systems.

Number	Name	Meaning	Explanation	Set by (When Set)	ACPU M9 ☐ ☐ ☐	Applicable CPU
SM1500	Hold mode	OFF : No-hold ON : Hold	• Specifies whether or not to hold the output value when a range over occurs for the S.IN instruction range check.	U	New	Q4AR
SM1501	Hold mode	OFF : No-hold ON : Hold	• Specifies whether or not the output value is held when a range over occurs for the S.OUT instruction range check.	U	New	
SM1510	Operation mode	OFF : Redundant system backup mode, independent system ON : Redundant system separate mode	• Turns on when the operating mode is redundant system separate.	S (Each END)	New	
SM1511	Start mode when power supply is on	OFF : System A fixed mode ON : Previous control system latch mode	• Turns on when the start mode for a redundant system when the power is turned on is the previous control system latch mode.	S (Initial)	New	
SM1512	Start mode when CPU is started	OFF : Initial start ON : Hot start	• Turns on when the CPU operation mode is hot start when the redundant system is started up.	S (Initial)	New	
SM1513	Operation status when CPU is started	OFF : Initial start ON : Hot start	• Turns on when the CPU operation mode is hot start when the redundant system is actually start up.	S (Initial)	New	
SM1514	Operation mode when CPU is switched	OFF : Initial start ON : Hot start	• Turns on when the operation is hot start when the CPU operation is switched for a redundant system.	S (Initial)	New	
SM1515	Output hold mode	OFF : Output reset ON : Output hold	• Turns on when the output mode during a stop error is output hold.	S (Each END)	New	
SM1516	Operation system status	OFF : Control system ON : Standby system	• Turns on when the CPU operation system status is the standby system.	S (Status change)	New	
SM1517	CPU startup status	OFF : Power supply on startup ON : Operation system switch starup	• Turns on when the CPU is started up by the operation system switch. • Reset using the user program.	S (Status change) /U	New	
SM1518	Tracking execution mode	OFF : Batch operation mode ON : Carryover mode	• When turned off when the tracking memory is in use during END, standby is executed until execution is possible. • When turned on when the tracking memory is being used-during END, this is repeatedly executed until the next END	U	New	
SM1520	Data tracking transmission link specification	OFF : No trigger ON : Trigger	SM1520 Block 1	U	New	
SM1521			Block 2			
SM1522			Block 3			
SM1523			Block 4			
SM1524			Block 5			
SM1525			Block 6			
SM1526			Block 7			
SM1527			Block 8			
SM1528			Block 9			
SM1529			Block 10			
SM1530			Block 11			
SM1531			Block 12			
SM1532			Block 13			
SM1533			Block 14			
SM1534			Block 15			
SM1535			Block 16			
SM1536			Block 17			
SM1537			Block 18			
SM1538			Block 19			
SM1539			Block 20			
SM1540			Block 21			
SM1541			Block 22			
SM1542			Block 23			
SM1543			Block 24			
SM1544			Block 25			
SM1545			Block 26			

Special Relay List (Continued)

Number	Name	Meaning	Explanation	Set by (When Set)	ACPU M9 ☐ ☐ ☐	Applicable CPU
SM1546	Data tracking transmission link specification	OFF: No trigger ON : Trigger	SM1546 Block 27	U	New	Q4AR
SM1547			SM1547 Block 28			
SM1548			SM1548 Block 29			
SM1549			SM1549 Block 30			
SM1550			SM1550 Block 31			
SM1551			SM1551 Block 32			
SM1552			SM1552 Block 33			
SM1553			SM1553 Block 34			
SM1554			SM1554 Block 35			
SM1555			SM1555 Block 36			
SM1556			SM1556 Block 37			
SM1557			SM1557 Block 38			
SM1558			SM1558 Block 39			
SM1559			SM1559 Block 40			
SM1560			SM1560 Block 41			
SM1561			SM1561 Block 42			
SM1562			SM1562 Block 43			
SM1563			SM1563 Block 44			
SM1564			SM1564 Block 45			
SM1565			SM1565 Block 46			
SM1566			SM1566 Block 47			
SM1567			SM1567 Block 48			
SM1568			SM1568 Block 49			
SM1569			SM1569 Block 50			
SM1570			SM1570 Block 51			
SM1571			SM1571 Block 52			
SM1572			SM1572 Block 53			
SM1573			SM1573 Block 54			
SM1574			SM1574 Block 55			
SM1575			SM1575 Block 56			
SM1576			SM1576 Block 57			
SM1577			SM1577 Block 58			
SM1578			SM1578 Block 59			
SM1579			SM1579 Block 60			
SM1580			SM1580 Block 61			
SM1581			SM1581 Block 62			
SM1582			SM1582 Block 63			
SM1583			SM1583 Block 64			
SM1590	Switching status from the network module	OFF: Normal ON : Switching unsuccessful	• Turns on when could not be executed normally when the network module detects a network error and issues a switching request to the host system CPU.	S (Error occurs)		

Special Relay List

(11) For redundant system (Other system CPU information *1) for Q4AR only SM1600 to SM1650 only valid for the CPU redundant system backup mode, so they cannot be refreshed during the separate mode. Either the backup mode or the separate mode is valid for the SM4651 to SM1699. SM1600 to SM1699 are all turned off for standalone system.

Number	Name	Meaning	Explanation	Set by (When Set)	ACPU M9 ☐ ☐ ☐ * 2	Applicable CPU
SM1600	Diagnosis error	OFF: No error ON : Error	• Turns on if a error occurs in the diagnosis results. (Including external diagnosis) • Remains on even if returns to normal thereafter.	S (Each END)	New	Q4AR
SM1601	Self diagnosis error	OFF: No self diagnosis error ON : Self diagnosis error	• Turns on when an error occurs in the self-diagnosis results. • Remains on even if returns to normal thereafter.	S (Each END)	New	
SM1605	Error common information	OFF: No error common information ON : Error common information	• Turns on when there is error common information and the SM1600 is on.	S (Each END)	New	
SM1616	Error individual information	OFF: No error individual information ON : Error individual information	• Turns on when there is error individual information and the SM1600 is on.	S (Each END)	New	
SM1653	STOP contact	STOP status	• Turns on when in the STOP status.	S (Each END)	New	
SM1654	PAUSE contact	PAUSE status	• Turns on when in the PAUSE status.	S (Each END)	New	
SM1655	STEP-RUN contact	STEP-RUN status	• Turns on when in the STEP-RUN status.	S (Each END)	New	

* 1 Stores other system CPU diagnostic information and system information.

* 2 This shows the special relay(SM ☐☐) for the host system CPU.

(12) For redundant system (tracking) for Q4AR only

Either the backup mode or the second mode is valid for SM1700 to SM1799. All is turned off for standalone system.

Number	Name	Meaning	Explanation			Set by (When Set)	ACPU M9 ☐ ☐ ☐	Applicable CPU
SM1700	Tracking execution flag	OFF : Execution not possible ON : Execution possible	• Turns on when tracking is executed normally.			S (status change)	New	Q4AR
SM1712	Transmission trigger end flag	OFF : Transmission uncompleted ON : Transmission end	SM1712	Block 1	• One scan turns on when the corresponding data transmission has been completed.	S (status change)	New	
SM1713			Block 2					
SM1714			Block 3					
SM1715			Block 4					
SM1716			Block 5					
SM1717			Block 6					
SM1718			Block 7					
SM1719			Block 8					
SM1720			Block 9					
SM1721			Block 10					
SM1722			Block 11					
SM1723			Block 12					
SM1724			Block 13					
SM1725			Block 14					
SM1726			Block 15					
SM1727			Block 16					
SM1728			Block 17					
SM1729			Block 18					
SM1730			Block 19					
SM1731			Block 20					
SM1732			Block 21					
SM1733			Block 22					

Special Relay List (Continued)

Number	Name	Meaning	Explanation		Set by (When Set)	ACPU M9 ☐ ☐ ☐	Applicable CPU
SM1734	Transmission trigger end flag	OFF : Transmission uncompleted ON : Transmission end	SM1734	Block 23	S (status change)	New	Q4AR
SM1735			SM1735	Block 24			
SM1736			SM1736	Block 25			
SM1737			SM1737	Block 26			
SM1738			SM1738	Block 27			
SM1739			SM1739	Block 28			
SM1740			SM1740	Block 29			
SM1741			SM1741	Block 30			
SM1742			SM1742	Block 31			
SM1743			SM1743	Block 32			
SM1744			SM1744	Block 33			
SM1745			SM1745	Block 34			
SM1746			SM1746	Block 35			
SM1747			SM1747	Block 36			
SM1748			SM1748	Block 37			
SM1749			SM1749	Block 38			
SM1750			SM1750	Block 39			
SM1751			SM1751	Block 40			
SM1752			SM1752	Block 41			
SM1753			SM1753	Block 42			
SM1754			SM1754	Block 43			
SM1755			SM1755	Block 44			
SM1756			SM1756	Block 45			
SM1757			SM1757	Block 46			
SM1758			SM1758	Block 47			
SM1759			SM1759	Block 48			
SM1760			SM1760	Block 49			
SM1761			SM1761	Block 50			
SM1762			SM1762	Block 51			
SM1763			SM1763	Block 52			
SM1764			SM1764	Block 53			
SM1765			SM1765	Block 54			
SM1766			SM1766	Block 55			
SM1767			SM1767	Block 56			
SM1768			SM1768	Block 57			
SM1769			SM1769	Block 58			
SM1770			SM1770	Block 59			
SM1771			SM1771	Block 60			
SM1772			SM1772	Block 61			
SM1773			SM1773	Block 62			
SM1774			SM1774	Block 63			
SM1775			SM1775	Block 64			

11.7 Special Register List

The special registers, SD, are internal registers with fixed applications in the programmable controller.

For this reason, it is not possible to use these registers in sequence programs in the same way that normal registers are used.

However, data can be written as needed in order to control the CPU modules and remote I/O modules.

Data stored in the special registers are stored as BIN values if no special designation has been made to the contrary.

The headings in the table that follows have the following meanings.

Item	Function of Item
Number	• Indicates special register number
Name	• Indicates name of special register
Meaning	• Indicates contents of special register
Explanation	• Discusses contents of special register in more detail
Set by (When set)	• Indicates whether the relay is set by the system or user, and, if it is set by the system, when setting is performed. <Set by> - S : Set by system - U : Set by user (sequence programs or test operations from peripheral devices) - S/U : Set by both system and user <When set> → Indicated only for registers set by system - Each END : Set during each END processing - Initial : Set only during initial processing (when power supply is turned ON, or when going from STOP to RUN) - Status change : Set only when there is a change in status - Error : Set when error occurs - Instruction execution : Set when instruction is executed - Request : Set only when there is a user request (through SM, etc.)
Corresponding ACPU M9 □ □ □	• Indicates corresponding special register in ACPU (D9 □ □ □)(Change and notation when there has been a change in contents) • Items indicated as "New" have been newly added for High Performance model QCPU/QnACPU
Corresponding CPU	• Indicates the corresponding CPU type name. ○+Rem: Can be applied to all CPU types and MELSECNET/H remote I/O modules. ○: Can be applied to all types of CPU - QCPU: Can be applied to high-performance model QCPU. - QnA: Can be applied to QnA series and Q2ASCPU series - Remote: Can be applied to the MELSECNET/H remote I/O modules. - Each CPU type name: Can be applied only to the specific CPU. (e.g. Q4ARCPU, Q3ACPU)

For details on the following items, see these manuals:

- Networks → • For Q MELSECNET/H Network System Reference Manual (PLC to PLC network)
 - For Q MELSECNET/H Network System Reference Manual (Remote I/O network)
 - MELSECNET/10 Network System Reference Manual for QnA
- SFC → QCPU(Q mode)/QnACPU Programming Manual (SFC)

POINT
(1) SD1200 to SD1255 are used for QnACPU. These relays are vacant with QCPU.
(2) Special register SD1500 and later are dedicated for Q4ARCPU.

Special Register List

(1) Diagnostic Information

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD0	Diagnostic errors	Diagnosis error code	- Error codes for errors found by diagnosis are stored as BIN data. - Contents identical to latest fault history information.	S (Error)	D9008 format change	
SD1	Clock time for diagnosis error occurrence	Clock time for diagnosis error occurrence	Year (last two digits) and month that SD0 data was updated is stored as BCD 2-digit code. (Example) B15 to B8 B7 to B0 : October, 1995 Year (0 to 99) Month (1 to 12) H9510	S (Error)	New	
SD2			The day and hour that SD0 was updated is stored as BCD 2-digit code. (Example) B15 to B8 B7 to B0 : 10 p.m. on 25th Day (1 to 31) Hour (0 to 23) H2510			
SD3			The minute and second that SD0 data was updated is stored as BCD 2-digit code. (Example) B15 to B8 B7 to B0 : 35 min. 48 sec. Minutes (0 to 59) Seconds (0 to 59) H3548			
SD4	Error information categories	Error information category code	- Category codes which help indicate what type of information is being stored in the common information areas (SD5 through SD15) and the individual information areas (SD16 through SD26) are stored here. B15 to B8 B7 to B0 Individual information category codes Common information category codes - The common information category codes store the following codes: 0 : No error 1 : Unit/module No./ PLC No./Base No. * 2 : File name/Drive name 3 : Time (value set) 4 : Program error location 5 : Switch cause (for Q4AR only) * : For a multiple PLC system, the module number or PLC number is stored depending on the error that occurred. (Refer to the corresponding error code for which number has been stored.) PLC No. 1: 1, PLC No. 2: 2, PLC No. 3: 3, PLC No. 4: 4 - The individual information category codes store the following codes: 0 : No error 1 : (Open) 2 : File name/Drive name 3 : Time (value actually measured) 4 : Program error location 5 : Parameter number 6 : Annunciator number 7 : Check instruction malfunction number	S (Error)	New	○+Rem

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																															
SD5	Error common information	Error common information	• Common information corresponding to the error codes (SD0) is stored here. • The following four types of information are stored here: ① Slot No. <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Slot No./PLC No./Base No. *1 *2</td></tr><tr><td>SD6</td><td>I/O No. (Not used for base No.)</td></tr><tr><td>SD7</td><td rowspan="9">(Vacant)</td></tr><tr><td>SD8</td></tr><tr><td>SD9</td></tr><tr><td>SD10</td></tr><tr><td>SD11</td></tr><tr><td>SD12</td></tr><tr><td>SD13</td></tr><tr><td>SD14</td></tr><tr><td>SD15</td></tr></table> *1: For a multiple PLC system, the slot number or PLC number is stored depending on the error that occurred. Slot 0 in the multiple PLC system is the one on the slot on the right of the rightmost CPU module. (Refer to the corresponding error code for which number has been stored.) PLC No. 1: 1, PLC No. 2: 2, PLC No. 3: 3, PLC No. 4: 4 *2: If a fuse blown or I/O verify error occurred in the module loaded in the MELSECNET/H remote I/O station, the network number is stored into the upper 8 bits and the station number into the lower 8 bits. Use the I/O No. to check the module where the fuse blown or I/O verify error occurred. ② File name/Drive name (Example) <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Drive</td></tr><tr><td>SD6</td><td rowspan="10">File name (ASCII code: 8 characters)</td></tr><tr><td>SD7</td></tr><tr><td>SD8</td></tr><tr><td>SD9</td></tr><tr><td>SD10</td></tr><tr><td>SD11</td></tr><tr><td>SD12</td></tr><tr><td>SD13</td></tr><tr><td>SD14</td></tr><tr><td>SD15</td></tr></table> File name= ABCDEFGH. IJK B15 to B8 B7 to B0 42H(B) 41H(A) 44H(D) 43H(C) 46H(F) 45H(E) 48H(H) 47H(G) 49H(I) 2EH(.) 4BH(K) 4AH(J)	Number	Meaning	SD5	Slot No./PLC No./Base No. *1 *2	SD6	I/O No. (Not used for base No.)	SD7	(Vacant)	SD8	SD9	SD10	SD11	SD12	SD13	SD14	SD15	Number	Meaning	SD5	Drive	SD6	File name (ASCII code: 8 characters)	SD7	SD8	SD9	SD10	SD11	SD12	SD13	SD14	SD15	S (Error)	New	○+Rem
Number				Meaning																																	
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SD14																																					
SD15																																					
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* 3: Refer to REMARK.

REMARK

1) Extensions are shown below.

SD10		SD11		Extension name	File type
Higher8 bits	Lower8 bits	Higher8 bits	Lower8 bits		
51H	50H	41H		QPA	Parameters
51H	50H	47H		QPG	Sequence program/SFC program
51H	43H	44H		QCD	Device comment
51H	44H	49H		QDI	Device initial value
51H	44H	52H		QDR	File register
51H	44H	53H		QDS	Simulation data
51H	44H	4CH		QDL	Local device
51H	54H	53H		QTS	Sampling trace data (For QnA)
51H	54H	4CH		QTL	Status latch data (For QnA)
51H	54H	50H		QTP	Program trace data (For QnA)
51H	54H	52H		QTR	SFC trace file
51H	46H	44H		QFD	Trouble history data

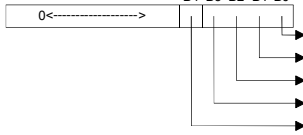
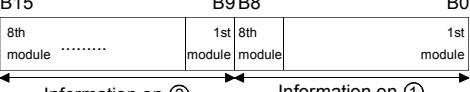
Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																							
SD5	Error common information	Error common information	③ Time (value set)	S (Error)	New	○+Rem																							
SD6																													
SD7																													
SD8																													
SD9																													
SD10																													
SD11																													
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* 4 Contents of pattern data																													
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15	14	to	4	3	2	1	0	←(Bit number)																					
0	0	to	0	0	*	*	*																						
(Not used)																													
SFC block designation present (1)/absent (0)																													
SFC step designation present (1)/absent (0)																													
SFC transition designation present (1)/absent (0)																													
⑤ Switch cause																													
<table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD5</td><td>Switch cause (0: automatic switch/ 1: manual switch)</td></tr><tr><td>SD6</td><td>Switch direction (0:standby system to control system/ 1: control system to standby system)</td></tr><tr><td>SD7</td><td>Tracking flag*5</td></tr><tr><td>SD8</td><td rowspan="8">(Vacant)</td></tr><tr><td>SD9</td></tr><tr><td>SD10</td></tr><tr><td>SD11</td></tr><tr><td>SD12</td></tr><tr><td>SD13</td></tr><tr><td>SD14</td></tr><tr><td>SD15</td></tr></table>		Number	Meaning	SD5	Switch cause (0: automatic switch/ 1: manual switch)	SD6	Switch direction (0:standby system to control system/ 1: control system to standby system)	SD7	Tracking flag*5	SD8	(Vacant)	SD9	SD10	SD11	SD12	SD13	SD14	SD15											
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* 5 Tracking flag contents																													
Shows whether or not the tracking data is valid.																													
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15	14	to	4	3	2	1	0	←(Bit number)																					
0	0	to	0	0	*	*	*																						
(Not used)																													
Invalid work data invalid (0) /valid (1)																													
System data (SFC active step information) invalid (0)/ valid (1)																													
Switching cause invalid (0)/ valid (1)																													

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																																																																																																																																																		
SD16	Error individual information	Error individual information	• Individual information corresponding to error codes (SD0) is stored here. ① File name/Drive name <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>Drive</td></tr><tr><td>SD17</td><td rowspan="4">File name (ASCII code: 8 characters)</td><td>42H(B) 41H(A)</td></tr><tr><td>SD18</td><td>44H(D) 43H(C)</td></tr><tr><td>SD19</td><td>46H(F) 45H(E)</td></tr><tr><td>SD20</td><td>48H(H) 47H(G)</td></tr><tr><td>SD21</td><td>Extension</td><td>2EH(.)</td><td>49H(I) 2EH(.)</td></tr><tr><td>SD22</td><td colspan="2">(ASCII code: 3 characters)</td><td>4BH(K) 4AH(J)</td></tr><tr><td>SD23</td><td rowspan="4">(Vacant)</td><td></td><td></td></tr><tr><td>SD24</td><td></td><td></td></tr><tr><td>SD25</td><td></td><td></td></tr><tr><td>SD26</td><td></td><td></td></tr></table> (Example) File name= ABCDEFGH. IJK B15 to B8 B7 to B0 ② Time (value actually measured) <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>Time : 1 μs units (0 to 999 μs)</td></tr><tr><td>SD17</td><td>Time : 1 ms units (0 to 65535 ms)</td></tr><tr><td>SD18</td><td rowspan="9">(Vacant)</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td></tr><tr><td>SD26</td></tr></table> ③ Program error location <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td rowspan="4">File name (ASCII code: 8 characters)</td></tr><tr><td>SD17</td></tr><tr><td>SD18</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td><td>Extension</td><td>2EH(.)</td></tr><tr><td>SD21</td><td colspan="2">(ASCII code: 3 characters)</td></tr><tr><td>SD22</td><td colspan="2">Pattern*</td></tr><tr><td>SD23</td><td colspan="2">Block No.</td></tr><tr><td>SD24</td><td colspan="2">Step No./transition No.</td></tr><tr><td>SD25</td><td colspan="2">Sequence step No. (L)</td></tr><tr><td>SD26</td><td colspan="2">Sequence step No. (H)</td></tr></table> * Contents of pattern data <table><tr><td>15</td><td>14</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>← (Bit number)</td></tr><tr><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>*</td><td>*</td><td>*</td><td></td></tr></table> (Not used) SFC block designation present (1)/absent (0) SFC step designation present (1)/absent (0) SFC transition designation present (1)/absent (0) ④ Parameter number ⑤ Annunciator number / CHK instruction malfunction number ⑥ Intelligent function module parameter error (for QCPU only) <table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>Parameter No.*6</td></tr><tr><td>SD17</td><td rowspan="4">(Vacant)</td></tr><tr><td>SD18</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td><td rowspan="4">(Vacant)</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td><td rowspan="2">(Vacant)</td></tr><tr><td>SD26</td></tr></table><table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>No.</td></tr><tr><td>SD17</td><td rowspan="4">(Vacant)</td></tr><tr><td>SD18</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td><td rowspan="4">(Vacant)</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td><td rowspan="2">(Vacant)</td></tr><tr><td>SD26</td></tr></table><table><tr><th>Number</th><th>Meaning</th></tr><tr><td>SD16</td><td>Parameter No. *6</td></tr><tr><td>SD17</td><td>Error code for intelligent function module</td></tr><tr><td>SD18</td><td rowspan="9">(Vacant)</td></tr><tr><td>SD19</td></tr><tr><td>SD20</td></tr><tr><td>SD21</td></tr><tr><td>SD22</td></tr><tr><td>SD23</td></tr><tr><td>SD24</td></tr><tr><td>SD25</td></tr><tr><td>SD26</td></tr></table> * 6 For details of the parameter numbers, refer to the user's manual of the CPU used.	Number	Meaning	SD16	Drive	SD17	File name (ASCII code: 8 characters)	42H(B) 41H(A)	SD18	44H(D) 43H(C)	SD19	46H(F) 45H(E)	SD20	48H(H) 47H(G)	SD21	Extension	2EH(.)	49H(I) 2EH(.)	SD22	(ASCII code: 3 characters)		4BH(K) 4AH(J)	SD23	(Vacant)			SD24			SD25			SD26			Number	Meaning	SD16	Time : 1 μs units (0 to 999 μs)	SD17	Time : 1 ms units (0 to 65535 ms)	SD18	(Vacant)	SD19	SD20	SD21	SD22	SD23	SD24	SD25	SD26	Number	Meaning	SD16	File name (ASCII code: 8 characters)	SD17	SD18	SD19	SD20	Extension	2EH(.)	SD21	(ASCII code: 3 characters)		SD22	Pattern*		SD23	Block No.		SD24	Step No./transition No.		SD25	Sequence step No. (L)		SD26	Sequence step No. (H)		15	14	to	4	3	2	1	0	← (Bit number)	0	0	to	0	0	*	*	*		Number	Meaning	SD16	Parameter No.*6	SD17	(Vacant)	SD18	SD19	SD20	SD21	(Vacant)	SD22	SD23	SD24	SD25	(Vacant)	SD26	Number	Meaning	SD16	No.	SD17	(Vacant)	SD18	SD19	SD20	SD21	(Vacant)	SD22	SD23	SD24	SD25	(Vacant)	SD26	Number	Meaning	SD16	Parameter No. *6	SD17	Error code for intelligent function module	SD18	(Vacant)	SD19	SD20	SD21	SD22	SD23	SD24	SD25	SD26	S (Error)	New	○+Rem
Number			Meaning																																																																																																																																																					
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SD16	Parameter No. *6																																																																																																																																																							
SD17	Error code for intelligent function module																																																																																																																																																							
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Special Register List (Continued)

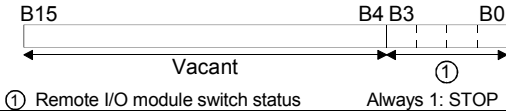
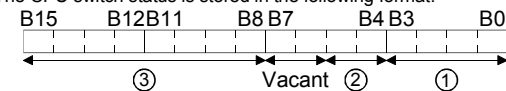
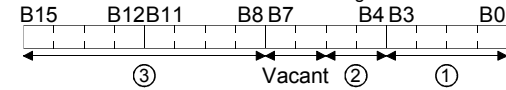
Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD50	Error reset	Error number that performs error reset	• Stores error number that performs error reset	U	New	○+Rem
SD51	Battery low latch	Bit pattern indicating where battery voltage drop occurred	• All corresponding bits go ON when battery voltage drops. • Subsequently, these remain ON even after battery voltage has been returned to normal.  • When QCPU is used, this flag is always OFF because memory card B is used as standard memory.	S (Error)	New	○
SD52	Battery low	Bit pattern indicating where battery voltage drop occurred	• Same configuration as SD51 above • Subsequently, goes OFF when battery voltage is restored to normal. • When QCPU is used, this flag is always OFF because memory card B is used as standard memory.	S (Error)	New	
SD53	AC DOWN detection	Number of times for AC DOWN	• Every time the input voltage falls to or below 85% (AC power)/65% (DC power) of the rating during calculation of the CPU module, the value is incremented by 1 and stored in BIN code.	S (Error)	D9005	○+Rem
SD54	MINI link errors	Error detection state	① The relevant station bit goes ON when any of the installed MINI (-S3) X(n+0)/X(n+20), X(n+6)/(n+26), X(n+7)/(n+27) or X(n+8)/X(n+28) goes ON. ② Goes ON when communications between the installed MINI (-S3) and the CPU are not possible.  Information on ② Information on ①	S (Error)	D9004 format change	QnA
SD60	Blown fuse number	Number of module with blown fuse	• Value stored here is the lowest station I/O number of the module with the blown fuse.	S (Error)	D9000	○+Rem
SD61	I/O module verification error number	I/O module verification error module number	• The lowest I/O number of the module where the I/O module verification number took place.	S (Error)	D9002	
SD62	Annunciator number	Annunciator number	• The first annunciator number to be detected is stored here.	S (Instruction execution)	D9009	○
SD63	Number of annunciators	Number of annunciators	• Stores the number of annunciators searched.	S (Instruction execution)	D9124	

Special Register List (Continued)

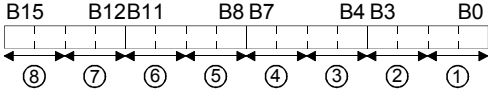
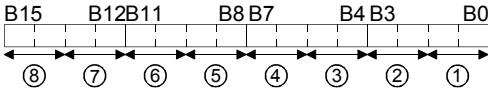
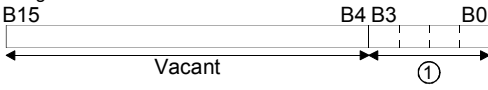
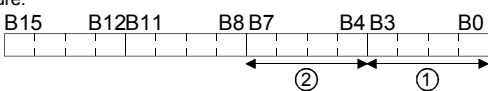
Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD64	Table of detected annunciator numbers	Annunciator detection number	When F goes ON due to [OUT F] or [SET F], the F numbers which go progressively ON from SD64 through SD79 are registered. F numbers turned OFF by [RST F] are deleted from SD64 to SD79, and are shifted to the data register following the data register where the deleted F numbers had been stored. Execution of the [LED R] instruction shifts the contents of SD64 to SD79 up by one. (This can also be done by using the INDICATOR RESET switch on the front of the CPU of the Q3A/Q4ACPU.) After 16 annunciators have been detected, detection of the 17th will not be stored from SD64 through SD79.	S (Instruction execution)	D9125	
SD65					D9126	
SD66					D9127	
SD67					D9128	
SD68					D9129	
SD69					D9130	
SD70					D9131	
SD71					D9132	
SD72					New	
SD73					New	
SD74					New	
SD75					New	
SD76					New	
SD77					New	
SD78					New	
SD79					New	
SD80	CHK number	CHK number	• Error codes detected by the CHK instruction are stored as BCD code.	S (Instruction execution)	New	
SD90	Step transition watchdog timer setting value (Enabled only when SFC program exists)	F number for timer set value and time over error	Corresponds to SM90	U	D9108	
SD91			Corresponds to SM91		D9109	
SD92			Corresponds to SM92		D9110	
SD93			Corresponds to SM93		D9111	
SD94			Corresponds to SM94		D9112	
SD95			Corresponds to SM95		D9113	
SD96			Corresponds to SM96		D9114	
SD97			Corresponds to SM97		New	
SD98			Corresponds to SM98		New	
SD99			Corresponds to SM99		New	
SD105	CH1 transmission speed setting (RS232)	Stores the preset transmission speed when GX Developer is used.	3 : 300bps, 6 : 600bps, 24 : 2400bps, 48 : 4800bps 96 : 9600bps, 192 : 19.2kbps, 384 : 38.4kbps 576 : 57.6kbps, 1152 : 115.2kbps	S	New	QCPU Remote

Special Register List (Continued)

(2) System information

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU						
SD200	State of switch	State of CPU switch	The switch status of the remote I/O module is stored in the following format. 	S (Always)	New	Remote						
			The CPU switch status is stored in the following format: <table border="1"><tr><td>①: CPU switch status</td><td>0: RUN 1: STOP 2: L.CLR</td></tr><tr><td>②: Memory card switch</td><td>Always OFF</td></tr><tr><td>③: DIP switch</td><td>B8 through BC correspond to SW1 through SW5 of system setting switch 1. 0: OFF, 1: ON BD through BF are vacant.</td></tr></table>	①: CPU switch status	0: RUN 1: STOP 2: L.CLR	②: Memory card switch	Always OFF	③: DIP switch	B8 through BC correspond to SW1 through SW5 of system setting switch 1. 0: OFF, 1: ON BD through BF are vacant.	S(Every END processing)	New	QCPU
			①: CPU switch status	0: RUN 1: STOP 2: L.CLR								
②: Memory card switch	Always OFF											
③: DIP switch	B8 through BC correspond to SW1 through SW5 of system setting switch 1. 0: OFF, 1: ON BD through BF are vacant.											
The CPU switch state is stored in the following format: <table border="1"><tr><td>①: CPU key State of switch</td><td>0 : RUN 1 : STOP 2 : L.CLR</td></tr><tr><td>②: Memory cards switch</td><td>B4 corresponds to card A, and B5 corresponds to card B OFF at 0; ON at 1</td></tr><tr><td>③: DIP switch</td><td>B8 through B12 correspond to SW1 through SW5 of system setting switch 1. B14 and B15 correspond to SW1 and SW2 of system setting switch 2, respectively. OFF at 0; ON at 1</td></tr></table>	①: CPU key State of switch	0 : RUN 1 : STOP 2 : L.CLR	②: Memory cards switch	B4 corresponds to card A, and B5 corresponds to card B OFF at 0; ON at 1	③: DIP switch	B8 through B12 correspond to SW1 through SW5 of system setting switch 1. B14 and B15 correspond to SW1 and SW2 of system setting switch 2, respectively. OFF at 0; ON at 1	S(Every END processing)	New	QnA			
①: CPU key State of switch	0 : RUN 1 : STOP 2 : L.CLR											
②: Memory cards switch	B4 corresponds to card A, and B5 corresponds to card B OFF at 0; ON at 1											
③: DIP switch	B8 through B12 correspond to SW1 through SW5 of system setting switch 1. B14 and B15 correspond to SW1 and SW2 of system setting switch 2, respectively. OFF at 0; ON at 1											

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9 ☐ ☐ ☐	Corresponding CPU
SD201	LED status	State of CPU-LED	The following bit patterns are used to store the statuses of the LEDs on the CPU:  ①: RUN ②: ERROR ③: USER ④: BAT.ALARM ⑤: BOOT ⑥: Vacant ⑦: Vacant ⑧: MODE Bit patterns for MODE 0: OFF, 1: Green, 2: Orange	S (Status change)	New	QCPU
			- Information concerning which of the following states the LEDs on the CPU are in is stored in the following bit patterns: 0 is off, 1 is on, and 2 is flicker  ①: RUN ②: ERROR ③: USER ④: BAT.ALARM ⑤: BOOT ⑥: CARD A (Memory card) ⑦: CARD B (Memory card) ⑧: Vacant	S (Status change)	New	QnA
SD202	LED off	Bit pattern of LED that is turned off	- Stores bit patterns of LEDs turned off (Only USER and BOOT enabled) - Turned off at 1, not turned off at 0	U	New	QnA
SD203	Operating state of CPU	Operating state of CPU	The operating status of the remote I/O module is stored in the following format.  ① Remote I/O module operating status Always 2: STOP	S (Always)	New	Remote
			The CPU operating state is stored as indicated in the following figure:  ①: Operating state of CPU ②: STOP/PAUSE cause 0: RUN 1: STEP-RUN 2: STOP 3: PAUSE 0: Switch 1: Remote contact 2: Remote operation from the GX Developer or Serial Communication. 3: Internal program instruction 4: Errors Note: Priority is earliest first	S (Every END processing)	D9015 format change	○
SD206	Device test execution type	0: Test not yet executed 1: During X device test 2: During Y device test 3: During X/Y device test	Set when the device test mode is executed on GX Developer.	S (Request)	New	Remote

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9 	Corresponding CPU
SD207	LED display priority ranking	Priorities 1 to 4	• When error is generated, the LED display (flicker) is made according to the error number setting priorities. • The setting areas for priorities are as follows: B15B12B11B8B7B4B3B0 SD207Priority 4Priority 3Priority 2Priority 1 SD208Priority 8Priority 7Priority 6Priority 5 SD209Priority 10Priority 9 Default ValueSD207=H4321 SD208=H8765 SD209=H00A9 • No display is made if "0" is set. However, even if "0" has been set, information concerning CPU operation stop (including parameter settings) errors will be indicated by the LEDs without conditions. See Section 7.9.5 REMARK for the priority order.	U	D9038	○
SD208		Priorities 5 to 8			D3039 format change	
SD209		Priorities 9 to 10			New	
SD210	Clock data	Clock data (year, month)	• The year (last two digits) and month are stored as BCD code at SD210 as shown below: B15toB12B11toB8B7toB4B3toB0 Year Month Example : July 1993 H9307	S/U (Request)	D9025	○+Rem
SD211	Clock data	Clock data (day, hour)	D9026			
SD212	Clock data	Clock data (minute, second)	D9027			
SD213	Clock data	Clock data (day of week)	• Stores the year (two digits) and the day of the week in SD213 in the BCD code format as shown below. B15toB12B11toB8B7toB4B3toB0 Higher digits of year (0 to 99) Day of week 0Sunday 1Monday 2Tuesday 3Wednesday 4Thursday 5Friday 6Saturday Example : Friday H0005 • The day of the week is stored as BCD code at SD213 as shown below: B15toB12B11toB8B7toB4B3toB0 Always set "0" Day of week 0Sunday 1Monday 2Tuesday 3Wednesday 4Thursday 5Friday 6Saturday Example : Friday H0005	S/U (Request)	D9028	QCPU Remote
				S/U (Request)	D9028	QnA

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																								
SD220	LED display data	Display indicator data	• LED display ASCII data (16 characters) stored here. B15 to B8 B7 to B0 <table><tr><td>SD220</td><td>15th character from the right</td><td>16th character from the right</td></tr><tr><td>SD221</td><td>13th character from the right</td><td>14th character from the right</td></tr><tr><td>SD222</td><td>11th character from the right</td><td>12th character from the right</td></tr><tr><td>SD223</td><td>9th character from the right</td><td>10th character from the right</td></tr><tr><td>SD224</td><td>7th character from the right</td><td>8th character from the right</td></tr><tr><td>SD225</td><td>5th character from the right</td><td>6th character from the right</td></tr><tr><td>SD226</td><td>3rd character from the right</td><td>4th character from the right</td></tr><tr><td>SD227</td><td>1st character from the right</td><td>2nd character from the right</td></tr></table>	SD220	15th character from the right	16th character from the right	SD221	13th character from the right	14th character from the right	SD222	11th character from the right	12th character from the right	SD223	9th character from the right	10th character from the right	SD224	7th character from the right	8th character from the right	SD225	5th character from the right	6th character from the right	SD226	3rd character from the right	4th character from the right	SD227	1st character from the right	2nd character from the right	S (When changed)	New	○
SD220			15th character from the right	16th character from the right																										
SD221			13th character from the right	14th character from the right																										
SD222			11th character from the right	12th character from the right																										
SD223			9th character from the right	10th character from the right																										
SD224			7th character from the right	8th character from the right																										
SD225			5th character from the right	6th character from the right																										
SD226			3rd character from the right	4th character from the right																										
SD227	1st character from the right	2nd character from the right																												
SD240	Base mode	0: Automatic mode 1: Detail mode	• Stores the base mode.	S (Initial)	New	QCPU Remote																								
SD241	No. of expansion bases	0: Basic only 1 to 7: No. of expansion bases	• Stores the maximum number of the expansion bases being installed.	S (Initial)	New																									
SD242	A/Q base differentiation	Base type differentiation 0: QA * * B is installed (A mode) 1: Q * * B is installed (Q mode)	B7 B2 B1 B0 Fixed to 0 to <																											

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9 ☐ ☐ ☐	Corresponding CPU
SD280	CC-Link error	Error detection status	① When Xn0 of the installed CC-Link goes ON, the bit corresponding to the station switches ON. ② When either Xn1 or XnF of the installed CC-Link switch OFF, the bit corresponding to the station switches ON. ③ Switches ON when the CPU cannot communicate with the installed CC-Link.	S (Error)	New	QCPU Remote
			① When Xn0 of the installed CC-Link goes ON, the bit corresponding to the station switches ON. ② When either Xn1 or XnF of the installed CC-Link switch OFF, the bit corresponding to the station switches ON. ③ Switches ON when the CPU cannot communicate with the installed CC-Link.	S (Error)	New	QnA
SD290	Device allocation (Same as parameter contents)	Number of points allocated for X	• Stores the number of points currently set for X devices	S (Initial)	New	○+Rem
SD291		Number of points allocated for Y	• Stores the number of points currently set for Y devices			
SD292		Number of points allocated for M	• Stores the number of points currently set for M devices			
SD293		Number of points allocated for L	• Stores the number of points currently set for L devices			○
SD294		Number of points allocated for B	• Stores the number of points currently set for B devices			○+Rem
SD295		Number of points allocated for F	• Stores the number of points currently set for F devices			○
SD296		Number of points allocated for SB	• Stores the number of points currently set for SB devices			○+Rem
SD297		Number of points allocated for V	• Stores the number of points currently set for V devices			○
SD298		Number of points allocated for S	• Stores the number of points currently set for S devices			
SD299		Number of points allocated for T	• Stores the number of points currently set for T device			
SD300		Number of points allocated for ST	• Stores the number of points currently set for ST devices			
SD301		Number of points allocated for C	• Stores the number of points currently set for C devices			

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9 ☐ ☐ ☐	Corresponding CPU
SD302	Device allocation (Same as parameter contents)	Number of points allocated for D	• Stores the number of points currently set for D devices	S (Initial)	New	○+Rem
SD303		Number of points allocated for W	• Stores the number of points currently set for W devices			
SD304		Number of points allocated for SW	• Stores the number of points currently set for SW devices			
SD315	Time reserved for communication processing	Time reserved for communication processing	Reserves the designated time for communication processing with GX Developer or other units. The greater the value is designated, the shorter the response time for communication with other devices (GX Developer, serial communication units) becomes. Setting range: 1 to 100 ms If the designated value is out of the range above, it is assumed to no setting. The scan time becomes longer by the designated time.	END processing	New	QCPU
SD340	Ethernet information	No. of modules installed	• Indicates the number of modules installed on Ethernet.	S (Initial)	New	QCPU Remote
SD341		I/O No.	• Ethernet I/O No. of the 1st module installed.			
SD342		Network No.	• Ethernet network No. of the 1st module installed.			
SD343		Group No.	• Ethernet group No. of the 1st module installed.			
SD344		Station No.	• Ethernet station No. of the 1st module installed.			
SD345 to SD346		Vacant	• Vacant (With QCPU, the Ethernet IP address of the 1st module is stored in buffer memory.)			
SD347		Vacant	• Vacant (With QCPU, the Ethernet error code of the 1st module is read with the ERRORRD instruction.)			
SD348 to SD354		Information from 2nd module	• Configuration is identical to that for the first module.	S (Initial)	New	
SD355 to SD361		Information from 3rd module	• Configuration is identical to that for the first module.			
SD362 to SD368		Information from 4th module	• Configuration is identical to that for the first module.			
SD340	Ethernet information	No. of modules installed	• Indicates the number of modules installed on Ethernet.	S (Initial)	New	QnA
SD341		I/O No.	• Ethernet I/O No. of the 1st module installed.			
SD342		Network No.	• Ethernet network No. of the 1st module installed.			
SD343		Group No.	• Ethernet group No. of the 1st module installed.			
SD344		Station No.	• Ethernet station No. of the 1st module installed.			
SD345 to SD346		IP address	• Ethernet IP address of the 1st module installed.			
SD347		Error code	• Ethernet error code of the 1st module installed.			
SD348 to SD354		Information from 2nd module	• Configuration is identical to that for the first module.	S (Initial)	New	
SD355 to SD361		Information from 3rd module	• Configuration is identical to that for the first module.			
SD362 to SD368		Information from 4th module	• Configuration is identical to that for the first module.			
SD380	Ethernet instruction reception status	Instruction reception status of 1st module	ON: Received (Channel is used.) OFF: Not received (Channel is not used.)	S (Initial)	New	

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD381	Ethernet instruction reception status	Information from 2nd module	• Configuration is identical to that for the first module.	S (Initial)	New	QnA
SD382		Information from 3rd module	• Configuration is identical to that for the first module.			
SD383		Information from 4th module	• Configuration is identical to that for the first module.			
SD392	Software version	Internal system software version	Stores the internal system software version in ASCII code. Higher byte Lower byte ↑ The data in the lower byte position is indefinite. The software version is stored in the higher byte position. For version "A", for example, "41H" is stored. Note: The internal system software version may differ from the version indicated by the version symbol printed on the case.	S (Initial)	D9060	QnA
SD395	Multiple PLC number	Multiple PLC number	In a multiple PLC system configuration, the PLC number of the host CPU is stored. PLC No. 1: 1, PLC No. 2: 2, PLC No. 3: 3, PLC No. 4: 4	S (Initial)	New	QCPU function Ver. B or later

(3) System clocks/counters

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD412	1 second counter	Number of counts in 1-second units	- Following programmable controller CPU RUN, 1 is added each second - Count repeats from 0 to 32767 to -32768 to 0	S (Status change)	D9022	○
SD414	2n second clock setting	2n second clock units	- Stores value n of 2n second clock (Default is 30) - Setting can be made between 1 and 32767	U	New	
SD415	2nms clock setting	2nms clock units	- Stores value n of 2nms clock (Default is 30) - Setting can be made between 1 and 32767	U	New	QCPU
SD420	Scan counter	Number of counts in each scan	- Incremented by 1 for each scan execution after the PLC is set to RUN. * - Count repeats from 0 to 32767 to -32768 to 0	S (Every END processing)	New	○
SD430	Low speed scan counter	Number of counts in each scan	- Incremented by 1 for each scan execution after the PLC is set to RUN. - Count repeats from 0 to 32767 to -32768 to 0 - Used only for low speed execution type programs	S (Every END processing)	New	

*: Not counted by the scan in an initial execution type program.

Special Register List (Continued)

(4) Scan information

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD500	Execution program No.	Execution type of program being executed	• Program number of program currently being executed is stored as BIN value.	S (Status change)	New	○
SD510	Low speed program No.	File name of low speed execution in progress	• Program number of low speed program currently being executed is stored as BIN value. • Enabled only when SM510 is ON.	S (Every END processing)	New	
SD520	Current scan time	Current scan time (in 1 ms units)	• Stores current scan time (in 1 ms units) Range from 0 to 65535	S (Every END processing)	D9017 format change	
SD521		Current scan time (in 100 μs units)	• Stores current scan time (in 100 μs units) Range from 00000 to 900 (Example) A current scan of 23.6 ms would be stored as follows: D520=23 D521=600	S (Every END processing)	New	
SD522	Initial scan time	Initial scan time (in 1 ms units)	• Stores scan time for initially execution type program. (in 1 ms units) • Range from 0 to 65535	S (First END processing)	New	
SD523		Initial scan time (in 100 μs units)	• Stores scan time for initially execution type program. (in 100 μs units) • Range of 000 to 900			
SD524	Minimum scan time	Minimum scan time (in 1 ms units)	• Stores minimum value of scan time (in 1 ms units) • Range from 0 to 65535	S (Every END processing)	D9018 format change	
SD525		Minimum scan time (in 100 μs units)	• Stores minimum value of scan time (in 100 μs units) • Range of 000 to 900	S (Every END processing)	New	
SD526	Maximum scan time	Maximum scan time (in 1 ms units)	• Stores maximum value of scan time, excepting the first scan. (in 1 ms units) • Range from 0 to 65535	S (Every END processing)	D9019 format change	
SD527		Maximum scan time (in 100 μs units)	• Stores maximum value of scan time, excepting the first scan. (in 100 μs units) • Range of 000 to 900		New	
SD528	Current scan time for low-speed execution type programs	Current scan time (in 1 ms units)	• Stores current scan time for low-speed execution type program (in 1 ms units)	S (Every END processing)	New	
SD529		Current scan time (in 100 μs units)	• Stores current scan time for low-speed execution type program (in 100 μs units) • Range of 000 to 900			
SD532	Minimum scan time for low-speed execution type programs	Minimum scan time (in 1 ms units)	• Stores minimum value of scan time for low-speed execution type program (in 1 ms units) • Range from 0 to 65535	S (Every END processing)	New	
SD533		Minimum scan time (in 100 μs units)	• Stores minimum value of scan time for low-speed execution type program (in 100 μs units) • Range of 000 to 900			
SD534	Maximum scan time for low-speed execution type programs	Maximum scan time (in 1 ms units)	• Stores the maximum scan time for all except low-speed execution type program's first scan. (in 1 ms units) • Range from 0 to 65535	S (Every END processing)	New	
SD535		Maximum scan time (in 100 μs units)	• Stores the maximum scan time for all except low-speed execution type program's first scan. (in 100 μs units) • Range of 000 to 900			
SD540	END processing time	END processing time (in 1 ms units)	• Stores time from completion of scan program to start of next scan. (in 1 ms units) • Range from 0 to 65535	S (Every END processing)	New	
SD541		END processing time (in 100 μs units)	• Stores time from completion of scan program to start of next scan. (in 100 μs units) • Range of 000 to 900			

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD542	Constant scan wait time	Constant scan wait time (in 1 ms units)	• Stores wait time when constant scan time has been set. (in 1 ms units) • Range from 0 to 65535	S (First END processing)	New	○
SD543		Constant scan wait time (in 100 μs units)	• Stores wait time when constant scan time has been set. (in 100 μs units) • Range of 000 to 900			
SD544	Cumulative execution time for low speed execution type programs	Cumulative execution time for low speed execution type programs (in 1 ms units)	• Stores cumulative execution time for low speed execution type programs. (in 1 ms units) • Range from 0 to 65535 • Cleared to 0 following 1 low speed scan	S (Every END processing)	New	
SD545		Cumulative execution time for low speed execution type programs (in 100 μs units)	• Stores cumulative execution time for low speed execution type programs. (in 100 μs units) • Range of 000 to 900 • Cleared to 0 following 1 low speed scan			
SD546	Execution time for low speed execution type programs	Execution time for low speed execution type programs (in 1 ms units)	• Stores low speed program execution time during 1 scan (in 1 ms units) • Range from 0 to 65535 • Stores each scan	S (Every END processing)	New	
SD547		Execution time for low speed execution type programs (in 100 μs units)	• Stores low speed program execution time during 1 scan (in 100 μs units) • Range of 000 to 900 • Stores each scan			
SD548	Scan program execution time	Scan program execution time (in 1 ms units)	• Stores execution time for scan execution type program during 1 scan (in 1 ms units) • Range from 0 to 65535 • Stores each scan	S (Every END processing)	New	
SD549		Scan program execution time (in 100 μs units)	• Stores execution time for scan execution type program during 1 scan (in 100 μs units) • vRange of 000 to 900 • Stores each scan			
SD550	Service interval measurement module	Unit/module No.	• Sets I/O number for module that measures service interval	U	New	○+Rem
SD551	Service interval time	Module service interval (in 1 ms units)	• When SM551 is ON, stores service interval for module designated by SD550. (in 1 ms units) • Range from 0 to 65535	S (Request)	New	
SD552		Module service interval (in 100 μs units)	• When SM551 is ON, stores service interval for module designated by SD550. (in 100 μs units) • Range from 000 to 900			

Special Register List

(5) Memory card

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD600	Memory card A models	Memory card A models	• Indicates memory card A model installed B15B8B7B4B3B0 0<----->0 Drive 3 (RAM) model (0: Does not exist) 1: SRAM Drive 4 (ROM) model (0: Does not exist (1: SRAM) (2: E²PROM) 3: FLASH ROM	S (Initial and card removal)	New	QCPU
			• Indicates memory card A model installed B15B8B7B4B3B0 0<----->0 Drive 1 (RAM) model 0: Does not exist 1: SRAM Drive 2 (ROM) model 0: Does not exist 2: EEPROM 3: Flash ROM	S (Initial and card removal)	New	QnA
SD602	Drive 1 (RAM) capacity	Drive 1 capacity	• Drive 1 capacity is stored in 1 k byte units	S (Initial and card removal)	New	QCPU
				S (Initial and card removal)	New	QnA
SD603	Drive 2 (ROM) capacity	Drive 2 capacity	• Drive 2 capacity is stored in 1 k byte units	S (Initial and card removal)	New	QCPU
				S (Initial and card removal)	New	QnA
SD604	Memory card A use conditions	Memory card A use conditions	• The use conditions for memory card A are stored as bit patterns (In use when ON) • The significance of these bit patterns is indicated below: B0: Boot operation (QBT) B1: Parameters (QPA) B2: Device comments (QCD) B3: Device initial value (QDI) B4: File register R (QDR) B5: Trace (QTS) B6: B7: B8: — B9: CPU fault history (QFD) BA: SFC trace (QTS) BB: Local device (QDL) BC: BD: BE: BF:	S (Status change)	New	QCPU
			• The use conditions for memory card A are stored as bit patterns (In use when ON) • The significance of these bit patterns is indicated below: B0: Boot operation (QBT) B1: Parameters (QPA) B2: Device comments (QCD) B3: Device initial value (QDI) B4: File register R (QDR) B5: Sampling trace (QTS) B6: Status latch (QTL) B7: Program trace (QTP) B8: Simulation data (QDS) B9: CPU fault history (QFD) B10: SFC trace (QTS) B11: Local device (QDL) B12: B13: B14: B15:	S (Status change)	New	QnA
SD620	Memory card B models	Memory card B models	• Indicates memory card B models installed B15B8B7B4B3B0 0<----->0 Drive 3 (RAM) model (0: Does not exist) 1: SRAM Drive 4 (ROM) model (0: Does not exist (1: SRAM) (2: E²PROM) 3: FLASH ROM Drive 4 is fixed to "3" because it has built-in flash ROM.	S (Initial)	New	QCPU

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																								
SD620	Memory card B models	Memory card B models	Indicates memory card B models installed B15B8B7B4B3B0 0<----->0 Drive 1 (RAM) model 0: Does not exist 1: SRAM Drive 2 (ROM) model 0: Does not exist 2: EEPROM 3: Flash ROM	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR																								
SD622	Drive 3 (RAM) capacity	Drive 3 capacity	Drive 3 capacity is stored in 1 k byte units.	S (Initial)	New	QCPU																								
			Drive 3 capacity is stored in 1 k byte units	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR																								
SD623	Drive 4 (ROM) capacity	Drive 4 capacity	Drive 4 capacity is stored in 1 k byte units.	S (Initial)	New	QCPU																								
			Drive 4 capacity is stored in 1 k byte units	S (Initial)	New	Q2A (S1) Q3A Q4A Q4AR																								
SD624	Drive 3/4 use conditions	Drive 3/4 use conditions	- The conditions for usage for drive 3/4 are stored as bit patterns. (In use when ON) - The significance of these bit patterns is indicated below: <table><tr><td>B0: Boot operation (QBT)</td><td>B8: Not used</td></tr><tr><td>B1: Parameters (QPA)</td><td>B9: CPU fault history (QFD)</td></tr><tr><td>B2: Device comments (QCD)</td><td>B10: SFC trace (QTS)</td></tr><tr><td>B3: Device initial value (QDI)</td><td>B11: Local device (QDL)</td></tr><tr><td>B4: File R (QDR)</td><td>B12: Not used</td></tr><tr><td>B5: Trace (QTS)</td><td>B13: Not used</td></tr><tr><td>B6: Not used</td><td>B14: Not used</td></tr><tr><td>B7: Not used</td><td>B15: Not used</td></tr></table>	B0: Boot operation (QBT)	B8: Not used	B1: Parameters (QPA)	B9: CPU fault history (QFD)	B2: Device comments (QCD)	B10: SFC trace (QTS)	B3: Device initial value (QDI)	B11: Local device (QDL)	B4: File R (QDR)	B12: Not used	B5: Trace (QTS)	B13: Not used	B6: Not used	B14: Not used	B7: Not used	B15: Not used	S (Status change)	New	QCPU								
	B0: Boot operation (QBT)	B8: Not used																												
B1: Parameters (QPA)	B9: CPU fault history (QFD)																													
B2: Device comments (QCD)	B10: SFC trace (QTS)																													
B3: Device initial value (QDI)	B11: Local device (QDL)																													
B4: File R (QDR)	B12: Not used																													
B5: Trace (QTS)	B13: Not used																													
B6: Not used	B14: Not used																													
B7: Not used	B15: Not used																													
	Memory card B use conditions	Memory card B use conditions	- The use conditions for memory card B are stored as bit patterns (In use when ON) - The significance of these bit patterns is indicated below: <table><tr><td>B0: Boot operation (QBT)</td><td>B8: Simulation data (QDS)</td></tr><tr><td>B1: Parameters (QPA)</td><td>B9: CPU fault history (QFD)</td></tr><tr><td>B2: Device comments (QCD)</td><td>B10: SFC trace (QTS)</td></tr><tr><td>B3: Device initial value (QDI)</td><td>B11: Local device (QDL)</td></tr><tr><td>B4: File R (QDR)</td><td>B12: Not used</td></tr><tr><td>B5: Sampling trace (QTS)</td><td>B13: Not used</td></tr><tr><td>B6: Status latch (QCL)</td><td>B14: Not used</td></tr><tr><td>B7: Program trace (QDL)</td><td>B15: Not used</td></tr></table>	B0: Boot operation (QBT)	B8: Simulation data (QDS)	B1: Parameters (QPA)	B9: CPU fault history (QFD)	B2: Device comments (QCD)	B10: SFC trace (QTS)	B3: Device initial value (QDI)	B11: Local device (QDL)	B4: File R (QDR)	B12: Not used	B5: Sampling trace (QTS)	B13: Not used	B6: Status latch (QCL)	B14: Not used	B7: Program trace (QDL)	B15: Not used	S (Status change)	New	Q2A (S1) Q3A Q4A Q4AR								
B0: Boot operation (QBT)	B8: Simulation data (QDS)																													
B1: Parameters (QPA)	B9: CPU fault history (QFD)																													
B2: Device comments (QCD)	B10: SFC trace (QTS)																													
B3: Device initial value (QDI)	B11: Local device (QDL)																													
B4: File R (QDR)	B12: Not used																													
B5: Sampling trace (QTS)	B13: Not used																													
B6: Status latch (QCL)	B14: Not used																													
B7: Program trace (QDL)	B15: Not used																													
SD640	File register drive	Drive number:	Stores drive number being used by file register	S (Initial)	New	○																								
SD641	File register file name	File register file name	Stores file register file name (with extension) selected at parameters or by use of QDRSET instruction as ASCII code. B15toB8B7toB0 <table><tr><td>SD641</td><td>Second character</td><td>SD641</td><td>First character</td></tr><tr><td>SD642</td><td>Fourth character</td><td>SD642</td><td>Third character</td></tr><tr><td>SD643</td><td>Sixth character</td><td>SD643</td><td>Fifth character</td></tr><tr><td>SD644</td><td>Eighth character</td><td>SD644</td><td>Seventh character</td></tr><tr><td>SD645</td><td>First character of extension</td><td>SD645</td><td>2EH(.)</td></tr><tr><td>SD646</td><td>Third character of extension</td><td>SD646</td><td>Second character of extension</td></tr></table>	SD641	Second character		SD641	First character	SD642	Fourth character	SD642	Third character	SD643	Sixth character	SD643	Fifth character	SD644	Eighth character	SD644	Seventh character	SD645	First character of extension	SD645	2EH(.)	SD646	Third character of extension	SD646	Second character of extension	S (Initial)	New
SD641				Second character	SD641		First character																							
SD642				Fourth character	SD642		Third character																							
SD643				Sixth character	SD643		Fifth character																							
SD644				Eighth character	SD644		Seventh character																							
SD645	First character of extension	SD645	2EH(.)																											
SD646	Third character of extension	SD646	Second character of extension																											
SD642																														
SD643																														
SD644																														
SD645																														
SD646																														
SD647	File register capacity	File register capacity	Stores the data capacity of the currently selected file register in 1 k word units.	S (Status change)	New																									
SD648	File register block number	File register block number	Stores the currently selected file register block number.	S (Status change)	D9035																									
SD650	Comment drive	Comment drive number	Stores the comment drive number selected at the parameters or by the QCDSET instruction.	S (Status change)	New																									

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																																										
SD651	Comment file name	Comment file name	Stores the comment file name (with extension) selected at the parameters or by the QCDSET instruction in ASCII code. <table><tr><td>B15</td><td>to</td><td>B8</td><td>B7</td><td>to</td><td>B0</td></tr><tr><td>SD651</td><td>Second character</td><td></td><td></td><td>First character</td><td></td></tr><tr><td>SD652</td><td>Fourth character</td><td></td><td></td><td>Third character</td><td></td></tr><tr><td>SD653</td><td>Sixth character</td><td></td><td></td><td>Fifth character</td><td></td></tr><tr><td>SD654</td><td>Eighth character</td><td></td><td></td><td>Seventh character</td><td></td></tr><tr><td>SD655</td><td>First character of extension</td><td></td><td></td><td>2EH(.)</td><td></td></tr><tr><td>SD656</td><td>Third character of extension</td><td></td><td></td><td>Second character of extension</td><td></td></tr></table>	B15	to	B8	B7	to	B0	SD651	Second character			First character		SD652	Fourth character			Third character		SD653	Sixth character			Fifth character		SD654	Eighth character			Seventh character		SD655	First character of extension			2EH(.)		SD656	Third character of extension			Second character of extension		S (Status change)	New	
B15				to	B8	B7	to	B0																																								
SD651				Second character			First character																																									
SD652				Fourth character			Third character																																									
SD653				Sixth character			Fifth character																																									
SD654				Eighth character			Seventh character																																									
SD655				First character of extension			2EH(.)																																									
SD656	Third character of extension			Second character of extension																																												
SD652																																																
SD653																																																
SD654																																																
SD655																																																
SD656																																																
SD660	Boot operation designation file	Boot designation file drive number	Stores the drive number where the boot designation file (* .QBT) is being stored.	S (Initial)	New	○																																										
SD661		File name of boot designation file	Stores the file name of the boot designation file (* .QBT). <table><tr><td>B15</td><td>to</td><td>B8</td><td>B7</td><td>to</td><td>B0</td></tr><tr><td>SD661</td><td>Second character</td><td></td><td></td><td>First character</td><td></td></tr><tr><td>SD662</td><td>Fourth character</td><td></td><td></td><td>Third character</td><td></td></tr><tr><td>SD663</td><td>Sixth character</td><td></td><td></td><td>Fifth character</td><td></td></tr><tr><td>SD664</td><td>Eighth character</td><td></td><td></td><td>Seventh character</td><td></td></tr><tr><td>SD665</td><td>First character of extension</td><td></td><td></td><td>2EH(.)</td><td></td></tr><tr><td>SD666</td><td>Third character of extension</td><td></td><td></td><td>Second character of extension</td><td></td></tr></table>	B15	to		B8	B7	to	B0	SD661	Second character			First character		SD662	Fourth character			Third character		SD663	Sixth character			Fifth character		SD664	Eighth character			Seventh character		SD665	First character of extension			2EH(.)		SD666	Third character of extension			Second character of extension		S (Initial)	New
B15				to	B8		B7	to	B0																																							
SD661				Second character				First character																																								
SD662				Fourth character				Third character																																								
SD663				Sixth character				Fifth character																																								
SD664				Eighth character				Seventh character																																								
SD665	First character of extension			2EH(.)																																												
SD666	Third character of extension			Second character of extension																																												
SD662																																																
SD663																																																
SD664																																																
SD665																																																
SD666																																																

(6) Instruction-Related Registers

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																					
SD705	Mask pattern	Mask pattern	• During block operations, turning SM705 ON makes it possible to use the mask pattern being stored at SD705 (or at SD705 and SD706 if double words are being used) to operate on all data in the block with the masked values.	U	New	○																					
SD706																											
SD714	Number of vacant communication request registration areas	0 to 32	• Stores the number of vacant blocks in the communications request area for remote terminal modules connected to the AJ71PT32-S3.	S (During execution)	M9081	QnA																					
SD715	IMASK instruction mask pattern	Mask pattern	• Patterns masked by use of the IMASK instruction are stored in the following manner: <table><tr><td></td><td colspan="2">B15</td><td colspan="2">B1</td><td>B0</td></tr><tr><td>SD715</td><td>I15</td><td>to</td><td>I1</td><td>I0</td></tr><tr><td>SD716</td><td>I31</td><td>to</td><td>I17</td><td>I16</td></tr><tr><td>SD717</td><td>I47</td><td>to</td><td>I33</td><td>I32</td></tr></table>		B15		B1		B0	SD715	I15	to	I1	I0	SD716	I31	to	I17	I16	SD717	I47	to	I33	I32	S (During execution)	New	○
				B15		B1		B0																			
SD715				I15	to	I1	I0																				
SD716	I31	to	I17	I16																							
SD717	I47	to	I33	I32																							
SD716																											
SD717																											
SD718 SD719	Accumulator	Accumulator	• For use as replacement for accumulators used in A-series programs.	S/U	New																						
SD720	Program No. designation for PLOAD instruction	Program No. designation for PLOAD instruction	• Stores the program number of the program to be loaded by the PLOAD instruction when designated. • Designation range: 1 to 124	U	New	QCPU																					
SD730	No. of vacant registration area for CC-Link communication request	0 to 32	• Stores the number of vacant registration area for the request for communication with the intelligent device station connected to A(1S)J61QBT61.	S (During execution)	New	QnA																					
SD736	PKEY input	PKEY input	• SD that temporarily stores keyboard data input by means of the PKEY instruction.	S (During execution)	New	QnA																					

Special Register List (Continued)

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD738	Message storage	Message storage	• Stores the message designated by the MSG instruction. B15 to B8 B7 to B0 SD738 2nd character 1st character SD739 4th character 3rd character SD740 6th character 5th character SD741 8th character 7th character SD742 10th character 9th character SD743 12th character 11th character SD744 14th character 13th character SD745 16th character 15th character SD746 18th character 17th character SD747 20th character 19th character SD748 22nd character 21st character SD749 24th character 23rd character SD750 26th character 25th character SD751 28th character 27th character SD752 30th character 29th character SD753 32nd character 31st character SD754 34th character 33rd character SD755 36th character 35th character SD756 38th character 37th character SD757 40th character 39th character SD758 42nd character 41st character SD759 44th character 43rd character SD760 46th character 45th character SD761 48th character 47th character SD762 50th character 49th character SD763 52nd character 51st character SD764 54th character 53rd character SD765 56th character 55th character SD766 58th character 57th character SD767 60th character 59th character SD768 62nd character 61st character SD769 64th character 63rd character	S (During execution)	New	○
SD739						
SD740						
SD741						
SD742						
SD743						
SD744						
SD745						
SD746						
SD747						
SD748						
SD749						
SD750						
SD751						
SD752						
SD753						
SD754						
SD755						
SD756						
SD757						
SD758						
SD759						
SD760						
SD761						
SD762						
SD763						
SD764						
SD765						
SD766						
SD767						
SD768						
SD769						
SD774 TO SD775	PID limit setting	0: Limit set 1: Limit not set	• Designate the limit for each PID loop as follows: B15 B1 B0 SD774 Loop16 to Loop2 Loop1 SD775 Loop32 to Loop18 Loop17	U	New	QCPU
SD780	Remaining No. of simultaneous execution of CC-Link dedicated instruction	0 to 32	• Stores the remaining number of simultaneous execution of the CC-Link dedicated instructions.	U	New	QnA
SD781 TO SD793	Mask pattern of IMASK instruction	Mask pattern	• Stores the mask patterns masked by the IMASK instruction as follows: B15 B1 B0 SD781 I63 to I49 I48 SD782 I79 to I65 I64 to SD793 I255 to I241 I240	S (During execution)	New	QCPU

Special Register List

(7) Debug

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																									
SD806	Status latch file name	Status latch file name	• Stores file name (with extension) from point in time when status latch was conducted as ASCII code. B15 to B8 B7 to B0 <table><tr><td>SD806</td><td>Second character</td><td>First character</td></tr><tr><td>SD807</td><td>Fourth character</td><td>Third character</td></tr><tr><td>SD808</td><td>Sixth character</td><td>Fifth character</td></tr><tr><td>SD809</td><td>Eighth character</td><td>seventh character</td></tr><tr><td>SD810</td><td>First character of extension</td><td>2EH(.)</td></tr><tr><td>SD811</td><td>Third character of extension</td><td>2nd character of extension</td></tr></table>	SD806	Second character	First character	SD807	Fourth character	Third character	SD808	Sixth character	Fifth character	SD809	Eighth character	seventh character	SD810	First character of extension	2EH(.)	SD811	Third character of extension	2nd character of extension	S (During execution)	New								
SD806				Second character	First character																										
SD807				Fourth character	Third character																										
SD808				Sixth character	Fifth character																										
SD809				Eighth character	seventh character																										
SD810				First character of extension	2EH(.)																										
SD811	Third character of extension	2nd character of extension																													
SD807																															
SD808																															
SD809																															
SD810																															
SD811																															
SD812	Status latch step	Status latch step	• Stores step number from point in time when status latch was conducted. <table><tr><td>SD812</td><td>Pattern *</td></tr><tr><td>SD813</td><td>Block No.</td></tr><tr><td>SD814</td><td>Step No./transition No.</td></tr><tr><td>SD815</td><td>Sequence step No.(L)</td></tr><tr><td>SD816</td><td>Sequence step No.(H)</td></tr></table> * Contents of pattern data <table><tr><td>15</td><td>14</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>← (Bit number)</td></tr><tr><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>*</td><td>*</td><td>*</td><td></td></tr></table> (Not in use) — SFC block designation present (1)/absent (0) 	SD812	Pattern *	SD813	Block No.	SD814	Step No./transition No.	SD815	Sequence step No.(L)	SD816	Sequence step No.(H)	15	14	to	4	3	2	1	0	← (Bit number)	0	0	to	0	0	*	*	*	
SD812				Pattern *																											
SD813				Block No.																											
SD814				Step No./transition No.																											
SD815				Sequence step No.(L)																											
SD816	Sequence step No.(H)																														
15	14	to	4	3	2	1	0	← (Bit number)																							
0	0	to	0	0	*	*	*																								

Special Register List

(8) Latch area

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD900	Drive where power was interrupted	Access file drive number during power loss	• Stores drive number if file was being accessed during power loss.	S (Status change)	New	QnA
SD901	File name active during power loss	Access file name during power loss	• Stores file name (with extension) in ASCII code if file was being accessed during power loss. B15 to B8 B7 to B0 SD901 2nd character 1st character SD902 4th character 3rd character SD903 6th character 5th character SD904 8th character 7th character SD905 1st character of extension 2EH(.) SD906 3rd character of extension 2nd character of extension	S (Status change)	New	
SD902						
SD903						
SD904						
SD905						
SD906						
SD910	RKEY input	RKEY input	• Stored in sequence that PU key code was entered. B15 to B8 B7 to B0 SD910 2nd character 1st character SD911 4th character 3rd character SD912 6th character 5th character SD913 8th character 7th character SD914 10th character 9th character SD915 12th character 11th character SD916 14th character 13th character SD917 16th character 15th character SD918 18th character 17th character SD919 20th character 19th character SD920 22nd character 21st character SD921 24th character 23rd character SD922 26th character 25th character SD923 28th character 27th character SD924 30th character 29th character SD925 32nd character 31st character	S (During execution)	New	
SD911						
SD912						
SD913						
SD914						
SD915						
SD916						
SD917						
SD918						
SD919						
SD920						
SD921						
SD922						
SD923						
SD924						
SD925						

(9) A to Q/QnA conversion correspondences

ACPU special registers D9000 to D9255 correspond to the special registers SD1000 to SD1255 after A-series to the Q/QnA-series conversion.

These special registers are all set by the system, and users cannot use them to set program data.

Users who need to set data with these registers should edit the special registers for the Q/QnA.

However, before conversion users could set data at special registers D9200 to D9255 only, and after conversion users can also set data at registers 1200 to 1255.

For more detailed information concerning the contents of the ACPU special registers, see the individual CPU users manual, and the MELSECNET and MELSECNET/B data link system reference manual.

REMARK

Supplemental explanation on "Special Register for Modification" column

- ① For the device numbers for which a special register for modification is specified, modify it to the special register for QCPU/QnACPU.
- ② For the device numbers for which ☐ is specified, special register after conversion can be used.
- ③ Device numbers for which ☒ is specified do not function for QCPU/QnACPU.

Special Register List

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																							
D9000	SD1000	—	Fuse blown	Number of module with blown fuse	- When fuse blown modules are detected, the lowest number of detected units is stored in hexadecimal. (Example: When fuses of Y50 to 6F output modules have blown, "50" is stored in hexadecimal) To monitor the number by peripheral devices, perform monitor operation given in hexadecimal. (Cleared when all contents of SD1100 to SD1107 are reset to 0.) - Fuse blow check is executed also to the output modules of remote I/O stations.	○																																							
D9001	SD1001	—	Fuse blown	Number of module with blown fuse	Stores the module numbers corresponding to setting switch numbers or base slot numbers when fuse blow occurred. <table border="1"><thead><tr><th colspan="2">I/O module for A0J2</th><th colspan="2">Extension base unit</th></tr><tr><th>Setting switch</th><th>Stored data</th><th>Base unit slot No.</th><th>Stored data</th></tr></thead><tbody><tr><td>0</td><td>1</td><td>0</td><td>5</td></tr><tr><td>1</td><td>2</td><td>1</td><td>6</td></tr><tr><td>2</td><td>3</td><td>2</td><td>7</td></tr><tr><td>3</td><td>4</td><td>3</td><td>8</td></tr><tr><td>4</td><td>5</td><td></td><td></td></tr><tr><td>5</td><td>6</td><td></td><td></td></tr><tr><td>6</td><td>7</td><td></td><td></td></tr><tr><td>7</td><td>8</td><td></td><td></td></tr></tbody></table>		I/O module for A0J2		Extension base unit		Setting switch	Stored data	Base unit slot No.	Stored data	0	1	0	5	1	2	1	6	2	3	2	7	3	4	3	8	4	5			5	6			6	7			7	8	
I/O module for A0J2		Extension base unit																																											
Setting switch	Stored data	Base unit slot No.	Stored data																																										
0	1	0	5																																										
1	2	1	6																																										
2	3	2	7																																										
3	4	3	8																																										
4	5																																												
5	6																																												
6	7																																												
7	8																																												

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																
D9002	SD1002	—	I/O module verification error	I/O module verification error module number	- If I/O modules, of which data are different from data entered, are detected when the power is turned on, the first I/O number of the lowest number unit among the detected units is stored in hexadecimal. (Storing method is the same as that of SD1000.) To monitor the number by peripheral devices, perform monitor operation given in hexadecimal. (Cleared when all contents of SD1116 to SD1123 are reset to 0.) - I/O module verify check is executed also to the modules of remote I/O terminals.	○																																
D9004	SD1004	—	MINI link errors	Stores setting status made at parameters (modules 1 to 8)	- Error status of the MINI(S3) link detected on loaded AJ71PT32(S3) is stored. <table border="1"><tr><td colspan="8" style="text-align: center;">B15 to B8</td><td colspan="8" style="text-align: center;">B7 to B0</td></tr><tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table> ↑ Bits which correspond to faulty AJ71PT32(S3) are turned on. ↑ Bits which correspond to the signals of AJ71PT32(S3), shown below, are turned on as the signals are turned on. - Hardware error (X0/X20) - MINI(S3) link error detection (X6/X26) - MINI(S3) link communication error (X7/X27)	B15 to B8								B7 to B0								8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	QnA
B15 to B8								B7 to B0																														
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1																							
D9005	SD1005	—	AC DOWN counter	Number of times for AC DOWN	When the AC power supply module is used, 1 is added at occurrence of an instantaneous power failure of within 20ms. (The value is stored in BIN code.)It is reset when power is switched from OFF to ON.	○																																
					When the DC power supply module is used, 1 is added at occurrence of an instantaneous power failure of within 10ms. (The value is stored in BIN code.)It is reset when power is switched from OFF to ON.																																	
					When the DC power supply module is used, 1 is added at occurrence of an instantaneous power failure of within 1ms. (The value is stored in BIN code.)It is reset when power is switched from OFF to ON.	QnA																																
D9008	SD1008	SD0	Self-diagnostic error	Self-diagnostic error number	When error is found as a result of self-diagnosis, error number is stored in BIN code.	○																																
D9009	SD1009	SD62	Annunciator detection	F number at which external failure has occurred	- When one of F0 to 255 is turned on by [OUT F] or [SET F], the F number, which has been detected earliest among the F numbers which have turned on, is stored in BIN code. - SD62 can be cleared by [RST F] or [LEDR] instruction. If another F number has been detected, the clearing of SD62 causes the next number to be stored in SD62.																																	
					- When one of F0 to 255 is turned on by [OUT F] or [SET F], the F number, which has been detected earliest among the F numbers which have turned on, is stored in BIN code. - SD62 can be cleared by executing [RST F] or [LEDR] instruction or moving INDICATOR RESET switch on CPU front to ON position. If another F number has been detected, the clearing of SD62 causes the nest number to be stored in SD62.																																	
D9010	SD1010		Error step	Step number at which operation error has occurred.	When operation error has occurred during execution of application instruction, the step number, at which the error has occurred, is stored in BIN code. Thereafter, each time operation error occurs, the contents of SD1010 are renewed.																																	

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9011	SD1011		Error step	Step number at which operation error has occurred.	When operation error has occurred during execution of application instruction, the step number, at which the error has occurred, is stored in BIN code. Since storage into SD1011 is made when SM1011 changes from off to on, the contents of SD1011 cannot be renewed unless SM1011 is cleared by user program.	
D9014	SD1014		I/O control mode	I/O control mode number	- The I/O control mode set is returned in any of the following numbers: - Both input and output in direct mode - Input in refresh mode, output in direct mode - Both input and output in refresh mode	
D9015	SD1015	SD203	Operating state of CPU	Operating state of CPU	The operation states of CPU as shown below are stored in SD203. * 1 When the CPU is in RUN mode and SM1040 is off, the CPU remains in RUN mode if changed to PAUSE mode.	
D9016	SD1016		Program number	0: Main program (ROM) 1: Main program (RAM) 2: Subprogram 1 (RAM) 3: Subprogram 2 (RAM) 4: Subprogram 3 (RAM) 5: Subprogram 1 (ROM) 6: Subprogram 2 (ROM) 7: Subprogram 3 (ROM) 8: Main program (E ² PROM) 9: Subprogram 1 (E ² PROM) A: Subprogram 2 (E ² PROM) B: Subprogram 3 (E ² PROM)	Indicates which sequence program is run presently. One value of 0 to B is stored in BIN code.	
D9017	SD1017	SD520	Scan time	Minimum scan time (10 ms units)	If scan time is smaller than the content of SD520, the value is newly stored at each END. Namely, the minimum value of scan time is stored into SD520 in BIN code.	
D9018	SD1018	SD524	Scan time	Scan time (10 ms units)	Scan time is stored in BIN code at each END and always rewritten.	

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9019	SD1019	SD526	Scan time	Maximum scan time (10 ms units)	• If scan time is larger than the content of SD526, the value is newly stored at each END. Namely, the maximum value of scan time is stored into SD526 in BIN code.	
D9020	SD1020		Constant scan	Constant scan time (User sets in 10 ms units)	• Sets the interval between consecutive program starts in multiples of 10 ms. 0: No setting 1 to 200: Set. Program is executed at intervals of (set value) × 10 ms.	
D9021	SD1021	—	Scan time	Scan time (1 ms units)	• Scan time is stored and updated in BIN code after every END.	
D9022	SD1022	SD412	1 second counter	Count in units of 1ms.	• When the PC CPU starts running, it starts counting 1 every second. • It starts counting up from 0 to 32767, then down to -32768 and then again up to 0. Counting repeats this routine.	
D9025	SD1025	SD210	Clock data	Clock data (year, month)	• Stores the year (2 lower digits) and month in BCD. B15 to B12 B11 to B8 B7 to B4 B3 to B0 Example: 1987, July H8707 Year Month	
D9026	SD1026	SD211	Clock data	Clock data (day, hour)	• Stores the day and hour in BCD. B15 to B12 B11 to B8 B7 to B4 B3 to B0 Example 31th, 10 o'clock H3110 Day Hour	
D9027	SD1027	SD212	Clock data	Clock data (minute, second)	• Stores the Minute and second in BCD. B15 to B12 B11 to B8 B7 to B4 B3 to B0 Example: 35 minutes, 48 seconds H3548 Minute Second	
D9028	SD1028	SD213	Clock data	Clock data (day of week)	• Stores the day of the week in BCD. B15 to B12 B11 to B8 B7 to B4 B3 to B0 Example: Friday H0005 0 must be set. Day of the week 0 Sunday 1 Monday 2 Tuesday 3 Wednesday 4 Thursday 5 Friday 6 Saturday	
D9035	SD1035	SD648	Extension file register	Use block No.	• Stores the block No. of the extension file register being used in BCD code.	
D9036	SD1036		Extension file register for designation of device number	Device number when individual devices from extension file register are directly accessed	• Designate the device number for the extension file register for direct read and write in 2 words at SD1036 and SD1037 in BIN data. Use consecutive numbers beginning with R0 of block No. 1 to designate device numbers. Extension file register 0 to Block No.1 area 16383 16384 to Block No.2 area SD1036,SD1037 Device No. (BIN data) to	
D9037	SD1037					
D9038	SD1038	SD207	LED display priority ranking	Priorities 1 to 4	• Sets priority of ERROR LEDs which illuminate (or flicker) to indicate errors with error code numbers. • Configuration of the priority setting areas is as shown below. B15 to B12 B11 to B8 B7 to B4 B3 to B0 SD207 Priority 4 Priority 3 Priority 2 Priority 1 SD208 Priority 7 Priority 6 Priority 5	
D9039	SD1039	SD208		Priorities 5 to 7	• For details, refer to the applicable CPUs User's Manual and the ACPU (Fundamentals) Programming manual.	

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU
D9044	SD1044		For sampling trace	Step or time during sampling trace	Turned on/off with a peripheral device. At scanning-----0 At time -----Time (10 msec unit) Stores the value in BIN code.	○
D9049	SD1049		Work area for SFC	Block number of extension file register	- Stores the block number of the expansion file register which is used as the work area for the execution of a SFC program in a binary value. - Stores "0" if an empty area of 16K bytes or smaller, which cannot be expansion file register No. 1, is used or if SM320 is OFF.	
D9050	SD1050		SFC program error number	Error code generated by SFC program	Stores code numbers of errors occurred in the SFC program in BIN code. 0: No error 80: SFC program parameter error 81: SFC code error 82: Number of steps of simultaneous execution exceeded 83: Block start error 84: SFC program operation error	
D9051	SD1051		Error block	Block number where error occurred	Stores the block number in which an error occurred in the SFC program in BIN code. In the case of error 83 the starting block number is stored.	
D9052	SD1052			Step number where error occurred	Stores the step number in which error 84 occurred in the SFC program in BIN code. Stores "0" when errors 80, 81 and 82 occurred. Stored the block starting step number when error 83 occurred.	
D9053	SD1053		Error transition	Transition condition number where error occurred	Stores the transfer condition number in which error 84 occurred in the SFC program in BIN code. Stored "0" when errors 80, 81, 82 and 83 occurred.	
D9054	SD1054		Error sequence step	Sequence step number where error occurred	Stores the sequence step number of transfer condition and operation output in which error 84 occurred in the SFC program in BIN code.	
D9055	SD1055	SD812	Status latch	Status latch step	- Stores the step number when status latch is executed. - Stores the step number in a binary value if status latch is executed in a main sequence program. - Stores the block number and the step number if status latch is executed in a SFC program. Block No. (BIN) Step No. (BIN) ← Higher 8 bits → ← Lower 8 bits →	QnA
D9060	SD1060	SD392	Software version	Software version of internal software	Stores the software version of the internal system in ASCII code. Higher byte Lower byte ↑ The data in the lower byte position is indefinite. The software version is stored in the higher byte position. For version "A", for example, "41H" is stored. Note: The software version of the initial system may differ from the version indicated by the version information printed on the rear of the case.	
D9072	SD1072		PLC communications check	Computer link data check	In the self-loopback test of the serial communication module, the serial communication module writes/reads data automatically to make communication checks.	
D9081	SD1081	SD714	Number of empty blocks in communications request registration area	Number of empty blocks in communications request registration area	Stores the number of empty blocks in the communication request registration area to the remote terminal module connected to the MELSECNET/MINI-S3 master unit, A2C or A52G.	QnA

Special Register List (Continued)

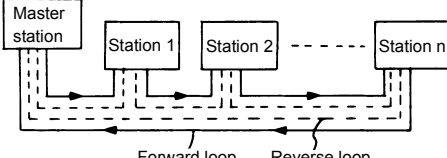
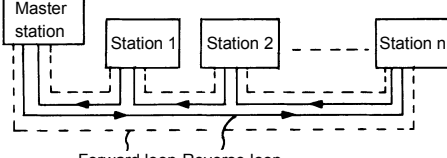
ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																				
D9085	SD1085		Register for setting time check value	Default value 10s	- Sets the time check time of the data link instructions (ZNRD, ZNWR) for the MELSECNET/10. - Setting range: 1 s to 65535 s (1 to 65535) - Setting unit: 1 s - Default value: 10 s (If 0 has been set, default 10 s is applied)																																																																					
D9090	SD1090		Number of special functions modules over	Number of special functions modules over	For details, refer to the manual of each microcomputer program package.																																																																					
D9091	SD1091		Detailed error code	Self-diagnosis detailed error code	Stores the detail code of cause of an instruction error.																																																																					
D9094	SD1094	SD251	Head I/O number for replacement	Head I/O number for replacement	Stores upper 2 digits of the head I/O address of I/O modules to be loaded or unloaded during online mode in BIN code. Example) Input module X2F0 → H2F																																																																					
D9100	SD1100	—	Fuse blown module	Bit pattern in units of 16 points, indicating the modules whose fuses have blown	Output module numbers (in units of 16 points), of which fuses have blown, are entered in bit pattern. (Preset output unit numbers when parameter setting has been performed.) SD1100 SD1101 SD1107 <table><tr><td></td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>SD1100</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1101</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1107</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> ↑ Indicates fuse blow.		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	SD1100	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	SD1101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SD1107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15				14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																							
SD1100	0				0	0	1	0	0	0	1	0	0	0	0	0	0	0	0																																																							
SD1101	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																							
SD1107	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																							
D9101	SD1101																																																																									
D9102	SD1102																																																																									
D9103	SD1103																																																																									
D9104	SD1104																																																																									
D9105	SD1105																																																																									
D9106	SD1106																																																																									
D9107	SD1107																																																																									
D9108	SD1108	—	Step transfer monitoring timer setting	Timer setting valve and the f number at time out	Sets value for the step transfer monitoring timer and the number of F which turns on when the monitoring timer timed out. b15 to b8 b7 to b0 Timer setting (1 to 255 s in seconds) F number setting (By turning on any of MSM708 to SM1114, the monitoring timer starts. If the transfer condition following a step which corresponds to the timer is not established within set time, set annunciator (F) is tuned on.)																																																																					
D9109	SD1109																																																																									
D9110	SD1110																																																																									
D9111	SD1111																																																																									
D9112	SD1112																																																																									
D9113	SD1113																																																																									
D9114	SD1114																																																																									
D9116	SD1116	—	I/O module verification error	Bit pattern, in units of 16 points, indicating the modules with verification errors.	When I/O modules, of which data are different from those entered at power-on, have been detected, the I/O unit numbers (in units of 16 points) are entered in bit pattern. (Preset I/O unit numbers when parameter setting has been performed.) SD1116 SD1117 SD1123 <table><tr><td></td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>SD1116</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>SD1117</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1123</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> ↑ Indicates I/O module verify error.		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	SD1116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	SD1117	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	SD1123	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
	15				14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																							
SD1116	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																																																							
SD1117	0				0	0	0	0	0	0	1	0	0	0	0	0	0	0	0																																																							
SD1123	0				0	0	0	0	1	0	0	0	0	0	0	0	0	0	0																																																							
D9117	SD1117																																																																									
D9118	SD1118																																																																									
D9119	SD1119																																																																									
D9120	SD1120																																																																									
D9121	SD1121																																																																									
D9122	SD1122																																																																									
D9123	SD1123																																																																									

Special Register List (Continued)

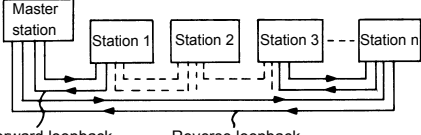
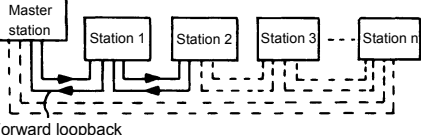
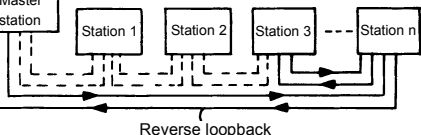
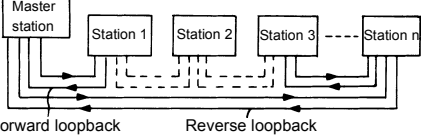
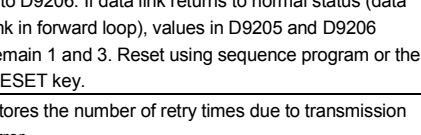
ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																																																																												
D9124	SD1124	SD63	Annunciator detection quantity	Annunciator detection quantity	- When one of F0 to 255 (F0 to 2047 for AuA and AnU) is turned on by [SET F], 1 is added to the contents of SD63. When [RST F] or [LEDR] instruction is executed, 1 is subtracted from the contents of SD63. (If the INDICATOR RESET switch is provided to the CPU, pressing the switch can execute the same processing.) - Quantity, which has been turned on by [SET F] is stored into SD63 in BIN code. The value of SD63 is maximum 8.	○																																																																																																																																												
D9125	SD1125	SD64	Annunciator detection number	Annunciator detection number	- When one of F0 to 255 (F0 to 2047 for AuA and AnU) is turned on by [SET F], F number, which has turned on, is entered into SD64 to SD71 in due order in BIN code. - F number, which has been turned off by [RST F], is erased from SD64 to SD71, and the contents of data registers succeeding the data register, where the erased F number was stored, are shifted to the preceding data registers. - By executing [LEDR] instruction, the contents of SD64 to SD71 are shifted upward by one. (For A3N, A3HCPU, it can be performed by use of INDICATOR RESET switch on front of CPU module.) - When there are 8 annunciator detections, the 9th one is not stored into SD64 to SD71 even if detected.																																																																																																																																													
D9126	SD1126	SD65																																																																																																																																																
D9127	SD1127	SD66																																																																																																																																																
D9128	SD1128	SD67																																																																																																																																																
D9129	SD1129	SD68																																																																																																																																																
D9130	SD1130	SD69																																																																																																																																																
D9131	SD1131	SD70																																																																																																																																																
D9132	SD1132	SD71																																																																																																																																																
					SET SET SET RST SET SET SET SET SET SET SET F50 F25 F99 F25 F15 F70 F65 F38 F110 F151 F210 LEDR <table><tr><td>SD62</td><td>0</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>99</td></tr><tr><td>SD63</td><td>0</td><td>1</td><td>2</td><td>3</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>8</td><td>8</td></tr><tr><td>SD64</td><td>0</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td><td>99</td></tr><tr><td>SD65</td><td>0</td><td>0</td><td>25</td><td>25</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>99</td><td>15</td></tr><tr><td>SD66</td><td>0</td><td>0</td><td>0</td><td>99</td><td>0</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>15</td><td>70</td></tr><tr><td>SD67</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>70</td><td>70</td><td>70</td><td>70</td><td>70</td><td>70</td><td>65</td></tr><tr><td>SD68</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>65</td><td>65</td><td>65</td><td>65</td><td>65</td><td>38</td></tr><tr><td>SD69</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>38</td><td>38</td><td>38</td><td>38</td><td>110</td></tr><tr><td>SD70</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>110</td><td>110</td><td>110</td><td>151</td></tr><tr><td>SD71</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>151</td><td>151</td><td>210</td></tr></table>		SD62	0	50	50	50	50	50	50	50	50	50	50	50	99	SD63	0	1	2	3	2	3	4	5	6	7	8	8	8	SD64	0	50	50	50	50	50	50	50	50	50	50	50	99	SD65	0	0	25	25	99	99	99	99	99	99	99	99	15	SD66	0	0	0	99	0	15	15	15	15	15	15	15	70	SD67	0	0	0	0	0	0	70	70	70	70	70	70	65	SD68	0	0	0	0	0	0	0	65	65	65	65	65	38	SD69	0	0	0	0	0	0	0	0	38	38	38	38	110	SD70	0	0	0	0	0	0	0	0	0	110	110	110	151	SD71	0	0	0	0	0	0	0	0	0	0	151	151	210
SD62	0	50	50	50	50		50	50	50	50	50	50	50	99																																																																																																																																				
SD63	0	1	2	3	2	3	4	5	6	7	8	8	8																																																																																																																																					
SD64	0	50	50	50	50	50	50	50	50	50	50	50	99																																																																																																																																					
SD65	0	0	25	25	99	99	99	99	99	99	99	99	15																																																																																																																																					
SD66	0	0	0	99	0	15	15	15	15	15	15	15	70																																																																																																																																					
SD67	0	0	0	0	0	0	70	70	70	70	70	70	65																																																																																																																																					
SD68	0	0	0	0	0	0	0	65	65	65	65	65	38																																																																																																																																					
SD69	0	0	0	0	0	0	0	0	38	38	38	38	110																																																																																																																																					
SD70	0	0	0	0	0	0	0	0	0	110	110	110	151																																																																																																																																					
SD71	0	0	0	0	0	0	0	0	0	0	151	151	210																																																																																																																																					

Special Register List (Continued)

(10) Special register list dedicated for QnA

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																																			
D9200	SD1200	—	ZNRD (LRDP for ACPU) processing results	0: Normal end 2: ZNRD instruction setting fault 3: Error at relevant station 4: Relevant station ZNRD execution disabled	Stores the execution result of the ZNRD (word device read) instruction • ZNRD instruction setting fault: Faulty setting of the ZNRD instruction constant, source, and/or destination • Corresponding station error: One of the stations is not communicating. • ZNRD cannot be executed in the corresponding station: The specified station is a remote I/O station.	QnA																																																																																																			
D9201	SD1201	—	ZNWR (LWTP for ACPU) processing results	0: Normal end 2: ZNWR instruction setting fault 3: Error at relevant station 4: Relevant station ZNWR execution disabled	Stores the execution result of the ZNWR (word device write) instruction. • ZNWR instruction setting fault: Faulty setting of the ZNWR instruction constant, source, and/or destination. • Corresponding station error: One of the stations is not communicating. • ZNWR cannot be executed in the corresponding station: The specified station is a remote I/O station.																																																																																																				
D9202	SD1202	—	Local station link type	Stores conditions for up to numbers 1 to 16	Stores whether the slave station corresponds to MELSECNET or MELSECNET 11. • Bits corresponding to the MELSECNET 11 stations become "1." • Bits corresponding to the MELSECNET stations or unconnected become "0."																																																																																																				
D9203	SD1203	—		Stores conditions for up to numbers 17 to 32	<table border="1"><thead><tr><th rowspan="2">Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr></thead><tbody><tr><td>SD1202</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>SD1203</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>SD1241</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>SD1242</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></tbody></table> • If a local station goes down during the operation, the contents before going down are retained. Contents of SD1224 to SD1227 and SD1228 to SD1231 are ORed. If the corresponding bit is "0", the corresponding bit of the special register above becomes valid. • If the own (master) station goes down, the contents before going down are also retained.	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1202	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	SD1203	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	SD1241	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	SD1242	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50
Device number	Bit																																																																																																								
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																									
SD1202	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																									
SD1203	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																																									
SD1241	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																									
SD1242	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																									
D9204	SD1204	—	Link state	0: Forward loop, during data link 1: Reverse loop, during data link 2: Loopback implemented in forward/reverse directions 3: Loopback implemented only in forward direction 4: Loopback implemented only in reverse direction 5: Data link disabled	Stores the present path status of the data link. • Data link in forward loop  • Data link in reverse loop 	QnA																																																																																																			

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																					
D9204	SD1204	—	Link state	0: Forward loop, during data link 1: Reverse loop, during data link 2: Loopback implemented in forward/reverse directions 3: Loopback implemented only in forward direction 4: Loopback implemented only in reverse direction 5: Data link disabled	• Loopback in forward/reverse loops  • Loopback in forward loop only  • Loopback in reverse loop only 	QnA																																																																																					
D9205	SD1205	—	Station implementing loopback	Station that implemented forward loopback	Stores the local or remote I/O station number at which loopback is being executed. 																																																																																						
D9206	SD1206	—	Station implementing loopback	Station that implemented reverse loopback	Forward loopback Reverse loopback In the above example, 1 is stored into D9205 and 3 into D9206. If data link returns to normal status (data link in forward loop), values in D9205 and D9206 remain 1 and 3. Reset using sequence program or the RESET key. 																																																																																						
D9210	SD1210	—	Number of retries	Stored as cumulative value	Stores the number of retry times due to transmission error. Count stops at maximum of "FFFFH" . RESET to return the count to 0.																																																																																						
D9211	SD1211	—	Number of times loop selected	Stored as cumulative value	Stores the number of times the loop line has been switched to reverse loop or loopback. Count stops at maximum of "FFFFH". RESET to return the count to 0.																																																																																						
D9212	SD1212	—	Local station operation state	Stores conditions for up to numbers 1 to 16	Stores the local station numbers which are in STOP or PAUSE mode. <table border="1"><thead><tr><th>Device number</th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr></thead><tbody><tr><td>SD1212</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>SD1213</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>SD1214</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>SD1215</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></tbody></table>	Device number	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1212	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	SD1213	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	SD1214	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	SD1215	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49	QnA
Device number	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																											
SD1212	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																											
SD1213	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																											
SD1214	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																											
SD1215	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																											
D9213	SD1213	—	Local station operation state	Stores conditions for up to numbers 17 to 32																																																																																							
D9214	SD1214	—	Local station operation state	Stores conditions for up to numbers 33 to 48																																																																																							
D9215	SD1215	—	Local station operation state	Stores conditions for up to numbers 49 to 64																																																																																							
					When a local station is switched to STOP or PAUSE mode, the bit corresponding to the station number in the register becomes "1". Example: When station 7 switches to STOP mode, bit 6 in SD1212 becomes "1" , and when SD1212 is monitored, its value is "64 (40H)".																																																																																						

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																																																																																																																																																																				
D9216	SD1216	—	Local station error detect state	Stores conditions for up to numbers 1 to 16	Stores the local station numbers which are in error. <table><tr><th>Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1216</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>SD1217</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>SD1218</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>SD1219</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></table> If a local station detects an error, the bit corresponding to the station number becomes "1". Example: When station 6 and 12 detect an error, bits 5 and 11 in SD1216 become "1", and when SD1216 is monitored, its value is "2080 (820H)".	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1216	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	SD1217	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	SD1218	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	SD1219	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																
Device number	Bit																																																																																																																																																																																																																																									
b15	b14	b13		b12		b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																																																																																																									
SD1216	L16	L15		L14		L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																																																																																																																																																								
SD1217	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																																																																																																																																																																										
SD1218	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																																																																																																																																																										
SD1219	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																																																																																																										
D9217	SD1217	—	Stores conditions for up to numbers 17 to 32																																																																																																																																																																																																																																							
D9218	SD1218	—		Stores conditions for up to numbers 33 to 48																																																																																																																																																																																																																																						
D9219	SD1219	—		Stores conditions for up to numbers 49 to 64																																																																																																																																																																																																																																						
D9220	SD1220	—	Local station parameters non-conforming; remote I/O station I/O allocation error	Stores conditions for up to numbers 1 to 16	Stores the local station numbers which contain mismatched parameters or of remote station numbers for which incorrect I/O assignment has been made. <table><tr><th>Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1220</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>SD1221</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>SD1222</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>SD1223</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></table> If a local station acting as the master station of tier three detects a parameter error or a remote station contains an invalid I/O assignment, the bit corresponding to the station number becomes "1". Example: When local station 5 and remote I/O station 14 detect an error, bits 4 and 13 in SD1220 become "1", and when SD1220 is monitored, its value is "8208 (2010H)" .	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1220	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	SD1221	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	SD1222	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	SD1223	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																
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SD1220	L16	L15		L14		L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																																																																																																																																																								
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SD1222	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																																																																																																																																																										
SD1223	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																																																																																																										
D9221	SD1221	—	Stores conditions for up to numbers 17 to 32																																																																																																																																																																																																																																							
D9222	SD1222	—	Stores conditions for up to numbers 33 to 48																																																																																																																																																																																																																																							
D9223	SD1223	—	Stores conditions for up to numbers 49 to 64																																																																																																																																																																																																																																							
D9224	SD1224	—	Local station and remote I/O station initial communications underway	Stores conditions for up to numbers 1 to 16	Stores the local or remote station numbers while they are communicating the initial data with their relevant master station. <table><tr><th>Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1224</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1225</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1226</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1227</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr></table> The bit corresponding to the station number which is currently communicating the initial settings becomes "1" . Example: When stations 23 and 45 are communicating, bit 6 of SD1225 and bit 12 of SD1226 become "1", and when SD1225 is monitored, its value is "64 (40H)", and when SD1226 is monitored, its value is "4096 (1000H)"	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1224	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1225	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1226	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1227	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
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D9226	SD1226	—		Stores conditions for up to numbers 33 to 48																																																																																																																																																																																																																																						
D9227	SD1227	—		Stores conditions for up to numbers 49 to 64																																																																																																																																																																																																																																						
D9228	SD1228	—	Local station and remote I/O station error	Stores conditions for up to numbers 1 to 16	Stores the local or remote station numbers which are in error. <table><tr><th>Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1228</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1229</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1230</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>SD1231</td><td><table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table></td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr></table> The bit corresponding to the station number with the error becomes "1" . Example: When local station 3 and remote I/O station 14 have an error, bits 2 and 13 of D9228 become "1", and when SD1228 is monitored, its value is "8196 (2004H)".	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1228	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1229	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1230	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	SD1231	<table><tr><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td><td>LR</td></tr><tr><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
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D9229	SD1229	—		Stores conditions for up to numbers 17 to 32																																																																																																																																																																																																																																						
D9230	SD1230	—		Stores conditions for up to numbers 33 to 48																																																																																																																																																																																																																																						
D9231	SD1231	—		Stores conditions for up to numbers 49 to 64																																																																																																																																																																																																																																						

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																																																																																																																																																																																																																																																	
D9232	SD1232	—	Local station and remote I/O station loop error	Stores conditions for up to numbers 1 to 8	<table><tr><th rowspan="2">Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1232</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1233</td><td>L/R8</td><td>L/R7</td><td>L/R6</td><td>L/R5</td><td>L/R4</td><td>L/R3</td><td>L/R2</td><td>L/R1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1234</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1235</td><td>L/R16</td><td>L/R15</td><td>L/R14</td><td>L/R13</td><td>L/R12</td><td>L/R11</td><td>L/R10</td><td>L/R9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1236</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1237</td><td>L/R24</td><td>L/R23</td><td>L/R22</td><td>L/R21</td><td>L/R20</td><td>L/R19</td><td>L/R18</td><td>L/R17</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1238</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1239</td><td>L/R32</td><td>L/R31</td><td>L/R30</td><td>L/R29</td><td>L/R28</td><td>L/R27</td><td>L/R26</td><td>L/R25</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1240</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1241</td><td>L/R40</td><td>L/R39</td><td>L/R38</td><td>L/R37</td><td>L/R36</td><td>L/R35</td><td>L/R34</td><td>L/R33</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1242</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1243</td><td>L/R48</td><td>L/R47</td><td>L/R46</td><td>L/R45</td><td>L/R44</td><td>L/R43</td><td>L/R42</td><td>L/R41</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1244</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1245</td><td>L/R56</td><td>L/R55</td><td>L/R54</td><td>L/R53</td><td>L/R52</td><td>L/R51</td><td>L/R50</td><td>L/R49</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SD1246</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td><td>R</td><td>F</td></tr><tr><td>SD1247</td><td>L/R64</td><td>L/R63</td><td>L/R62</td><td>L/R61</td><td>L/R60</td><td>L/R59</td><td>L/R58</td><td>L/R57</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> In the above table, "F" indicates a forward loop line and "R" a reverse loop line .The bit corresponding to the station number at which the forward or reverse loop error has occurred, becomes "1". Example: When the forward loop line of station 5 has an error, bit 8 of SD1232 become "1", and when SD1232 is monitored, its value is "256 (100H)".	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1232	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1233	L/R8	L/R7	L/R6	L/R5	L/R4	L/R3	L/R2	L/R1									SD1234	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1235	L/R16	L/R15	L/R14	L/R13	L/R12	L/R11	L/R10	L/R9									SD1236	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1237	L/R24	L/R23	L/R22	L/R21	L/R20	L/R19	L/R18	L/R17									SD1238	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1239	L/R32	L/R31	L/R30	L/R29	L/R28	L/R27	L/R26	L/R25									SD1240	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1241	L/R40	L/R39	L/R38	L/R37	L/R36	L/R35	L/R34	L/R33									SD1242	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1243	L/R48	L/R47	L/R46	L/R45	L/R44	L/R43	L/R42	L/R41									SD1244	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1245	L/R56	L/R55	L/R54	L/R53	L/R52	L/R51	L/R50	L/R49									SD1246	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F	SD1247	L/R64	L/R63	L/R62	L/R61	L/R60	L/R59	L/R58	L/R57									QnA
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SD1234	R	F		R		F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																					
SD1235	L/R16	L/R15		L/R14		L/R13	L/R12	L/R11	L/R10	L/R9																																																																																																																																																																																																																																																																																																													
SD1236	R	F		R		F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																					
SD1237	L/R24	L/R23	L/R22	L/R21	L/R20	L/R19	L/R18	L/R17																																																																																																																																																																																																																																																																																																															
SD1238	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																							
SD1239	L/R32	L/R31	L/R30	L/R29	L/R28	L/R27	L/R26	L/R25																																																																																																																																																																																																																																																																																																															
SD1240	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																							
SD1241	L/R40	L/R39	L/R38	L/R37	L/R36	L/R35	L/R34	L/R33																																																																																																																																																																																																																																																																																																															
SD1242	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																							
SD1243	L/R48	L/R47	L/R46	L/R45	L/R44	L/R43	L/R42	L/R41																																																																																																																																																																																																																																																																																																															
SD1244	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																							
SD1245	L/R56	L/R55	L/R54	L/R53	L/R52	L/R51	L/R50	L/R49																																																																																																																																																																																																																																																																																																															
SD1246	R	F	R	F	R	F	R	F	R	F	R	F	R	F	R	F																																																																																																																																																																																																																																																																																																							
SD1247	L/R64	L/R63	L/R62	L/R61	L/R60	L/R59	L/R58	L/R57																																																																																																																																																																																																																																																																																																															
D9233	SD1233	—	Stores conditions for up to numbers 9 to 16																																																																																																																																																																																																																																																																																																																				
D9234	SD1234	—	Stores conditions for up to numbers 17 to 24																																																																																																																																																																																																																																																																																																																				
D9235	SD1235	—	Stores conditions for up to numbers 25 to 32																																																																																																																																																																																																																																																																																																																				
D9236	SD1236	—	Stores conditions for up to numbers 33 to 40																																																																																																																																																																																																																																																																																																																				
D9237	SD1237	—	Stores conditions for up to numbers 41 to 48																																																																																																																																																																																																																																																																																																																				
D9238	SD1238	—	Stores conditions for up to numbers 49 to 56																																																																																																																																																																																																																																																																																																																				
D9239	SD1239	—	Stores conditions for up to numbers 57 to 64																																																																																																																																																																																																																																																																																																																				
D9240	SD1240	—	Number of times communications errors detected	Stores cumulative total of receive errors	Stores the number of times the following transmission errors have been detected: CRC, OVER, AB, IF Count is made to a maximum of FFFFH. RESET to return the count to 0.	QnA																																																																																																																																																																																																																																																																																																																	
D9241	SD1241	—	Local station link type	Stores conditions for up to numbers 33 to 48	Stores whether the slave station corresponds to MELSECNET or MELSECNET11. • Bits corresponding to the MELSECNET 11 stations become "1." • Bits corresponding to the MELSECNET stations or unconnected become "0."																																																																																																																																																																																																																																																																																																																		
D9242	SD1242	—		Stores conditions for up to numbers 49 to 64	<table><tr><th rowspan="2">Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1202</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>SD1203</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>SD1241</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>SD1242</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></table> • If a local station goes down during the operation, the contents before going down are retained. Contents of SD1224 to SD1227 and SD1228 to SD1231 are ORed. If the corresponding bit is "0", the corresponding bit of the special register above becomes valid. • If the own (master) station goes down, the contents before going down are also retained.		Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1202	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	SD1203	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	SD1241	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	SD1242	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																																																																																												
Device number	Bit																																																																																																																																																																																																																																																																																																																						
	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																																																																																																																																																																																																																							
SD1202	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																																																																																																																																																																																																																																							
SD1203	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																																																																																																																																																																																																																																																							
SD1241	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																																																																																																																																																																																																																																							
SD1242	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																																																																																																																																																																																																																							
D9243	SD1243	—	Station number information for host station	Stores station number (0 to 64)	Allows a local station to confirm its own station number	QnA																																																																																																																																																																																																																																																																																																																	
D9244	SD1244	—	Number of link device stations	Stores number of slave stations	Indicates the number of slave stations in one loop.																																																																																																																																																																																																																																																																																																																		
D9245	SD1245	—	Number of times communications errors detected	Stores cumulative total of receive errors	Stores the number of times the following transmission errors have been detected: CRC, OVER, AB, IF Count is made to a maximum of FFFFH. RESET to return the count to 0.																																																																																																																																																																																																																																																																																																																		

Special Register List (Continued)

ACPU Special Conversion	Special Register after Conversion	Special Register for Modification	Name	Meaning	Details	Corresponding CPU																																																																																																																	
D9248	SD1248	—	Local station operation state	Stores conditions for up to numbers 1 to 16	Stores the local station number which is in STOP or PAUSE mode. <table><tr><th rowspan="2">Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1248</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>D9249</td><td>SD1249</td><td>—</td><td>Stores conditions for up to numbers 17 to 32</td><td>SD1249</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>D9250</td><td>SD1250</td><td>—</td><td>Stores conditions for up to numbers 33 to 48</td><td>SD1250</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>D9251</td><td>SD1251</td><td>—</td><td>Stores conditions for up to numbers 49 to 64</td><td>SD1251</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></table> The bit corresponding to the station number which is in STOP or PAUSE mode, becomes "1". Example: When local stations 7 and 15 are in STOP mode, bits 6 and 14 of SD1248 become "1", and when SD1248 is monitored, its value is "16448 (4040H)".	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1248	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	D9249	SD1249	—	Stores conditions for up to numbers 17 to 32	SD1249	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	D9250	SD1250	—	Stores conditions for up to numbers 33 to 48	SD1250	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	D9251	SD1251	—	Stores conditions for up to numbers 49 to 64	SD1251	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49	QnA
Device number	Bit																																																																																																																						
	b15	b14		b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																						
SD1248	L16	L15		L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																																						
D9249	SD1249	—	Stores conditions for up to numbers 17 to 32	SD1249	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																																																			
D9250	SD1250	—	Stores conditions for up to numbers 33 to 48	SD1250	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																																			
D9251	SD1251	—	Stores conditions for up to numbers 49 to 64	SD1251	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																			
D9252	SD1252	—	Local station error conditions	Stores conditions for up to numbers 1 to 16	Stores the local station number other than the host, which is in error. <table><tr><th rowspan="2">Device number</th><th colspan="16">Bit</th></tr><tr><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SD1252</td><td>L16</td><td>L15</td><td>L14</td><td>L13</td><td>L12</td><td>L11</td><td>L10</td><td>L9</td><td>L8</td><td>L7</td><td>L6</td><td>L5</td><td>L4</td><td>L3</td><td>L2</td><td>L1</td></tr><tr><td>D9253</td><td>SD1253</td><td>—</td><td>Stores conditions for up to numbers 17 to 32</td><td>SD1253</td><td>L32</td><td>L31</td><td>L30</td><td>L29</td><td>L28</td><td>L27</td><td>L26</td><td>L25</td><td>L24</td><td>L23</td><td>L22</td><td>L21</td><td>L20</td><td>L19</td><td>L18</td><td>L17</td></tr><tr><td>D9254</td><td>SD1254</td><td>—</td><td>Stores conditions for up to numbers 33 to 48</td><td>SD1254</td><td>L48</td><td>L47</td><td>L46</td><td>L45</td><td>L44</td><td>L43</td><td>L42</td><td>L41</td><td>L40</td><td>L39</td><td>L38</td><td>L37</td><td>L36</td><td>L35</td><td>L34</td><td>L33</td></tr><tr><td>D9255</td><td>SD1255</td><td>—</td><td>Stores conditions for up to numbers 49 to 64</td><td>SD1255</td><td>L64</td><td>L63</td><td>L62</td><td>L61</td><td>L60</td><td>L59</td><td>L58</td><td>L57</td><td>L56</td><td>L55</td><td>L54</td><td>L53</td><td>L52</td><td>L51</td><td>L50</td><td>L49</td></tr></table> The bit corresponding to the station number which is in error, becomes "1". Example: When local station 12 is in error, bit 11 of SD1252 becomes "1", and when SD1252 is monitored, its value is "2048 (800H)".	Device number	Bit																b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	SD1252	L16	L15	L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1	D9253	SD1253	—	Stores conditions for up to numbers 17 to 32	SD1253	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17	D9254	SD1254	—	Stores conditions for up to numbers 33 to 48	SD1254	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33	D9255	SD1255	—	Stores conditions for up to numbers 49 to 64	SD1255	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49	
Device number	Bit																																																																																																																						
	b15	b14		b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0																																																																																																						
SD1252	L16	L15		L14	L13	L12	L11	L10	L9	L8	L7	L6	L5	L4	L3	L2	L1																																																																																																						
D9253	SD1253	—	Stores conditions for up to numbers 17 to 32	SD1253	L32	L31	L30	L29	L28	L27	L26	L25	L24	L23	L22	L21	L20	L19	L18	L17																																																																																																			
D9254	SD1254	—	Stores conditions for up to numbers 33 to 48	SD1254	L48	L47	L46	L45	L44	L43	L42	L41	L40	L39	L38	L37	L36	L35	L34	L33																																																																																																			
D9255	SD1255	—	Stores conditions for up to numbers 49 to 64	SD1255	L64	L63	L62	L61	L60	L59	L58	L57	L56	L55	L54	L53	L52	L51	L50	L49																																																																																																			

(11) Fuse blown module

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																																																																				
SD1300 SD1301 SD1302 SD1303 SD1304 SD1305 SD1306 SD1307 SD1308 SD1309 to SD1330 SD1331	Fuse blown module	Bit pattern in units of 16 points, indicating the modules whose fuses have blown 0: No blown fuse 1: Blown fuse present	- The numbers of output modules whose fuses have blown are input as a bit pattern (in units of 16 points). (If the module numbers are set by parameter, the parameter-set numbers are stored.) - Also detects blown fuse condition at remote station output modules <table><tr><td></td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>SD1300</td><td>0</td><td>0</td><td>0</td><td>1 (YC0)</td><td>0</td><td>0</td><td>0</td><td>1 (YB0)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1301</td><td>1 (YF0)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (Y1A)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1331</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (Y1F B0)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 (Y1F 30)</td><td>0</td><td>0</td></tr></table> ↑ Indicates a blown fuse - Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation (refer to 11.3.).		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	SD1300	0	0	0	1 (YC0)	0	0	0	1 (YB0)	0	0	0	0	0	0	0	0	SD1301	1 (YF0)	0	0	0	0	1 (Y1A)	0	0	0	0	0	0	0	0	0	0	SD1331	0	0	0	0	1 (Y1F B0)	0	0	0	0	0	0	0	0	1 (Y1F 30)	0	0	S (Error)	D9100 D9101 D9102 D9103 D9104 D9105 D9106 D9107 New New to New New	○+Rem
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																										
SD1300	0	0	0	1 (YC0)	0	0	0	1 (YB0)	0	0	0	0	0	0	0	0																																																										
SD1301	1 (YF0)	0	0	0	0	1 (Y1A)	0	0	0	0	0	0	0	0	0	0																																																										
SD1331	0	0	0	0	1 (Y1F B0)	0	0	0	0	0	0	0	0	1 (Y1F 30)	0	0																																																										
SD1350 to SD1381	External power supply disconnected module (For future expansion)	Bit pattern in units of 16 points, indicating the modules whose external power supply has been disconnected 0: External power supply disconnected 1: External power supply is not disconnected	The module number (in units of 16 points) whose external power supply has been disconnected is input as a bit pattern. (If the module numbers are set by parameter, the parameter-set numbers are used.) <table><tr><td></td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>SD1350</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SD1351</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> <table><tr><td>SD1381</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr></table> ↑ Indicates a blown fuse		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	SD1350	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	SD1351	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	SD1381	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	S (Error)	New	QCPU Remote
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																																										
SD1350	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0																																																										
SD1351	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0																																																										
SD1381	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0																																																										

Special Register List (Continued)

(12) I/O module verification

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU																																																			
SD1400	I/O module verification error	Bit pattern, in units of 16 points, indicating the modules with verification errors. 0: No I/O verification errors 1: I/O verification error present	- When the power is turned on, the module numbers of the I/O modules whose information differs from the registered I/O module information are set in this register (in units of 16 points). (If the I/O numbers are set by parameter, the parameter-set numbers are stored.) - Also detects I/O module information 1514131211109876543210 <table><tr><td>D9116</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 ($\frac{N}{16}$)</td></tr><tr><td>D9117</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1 ($\frac{N}{16}$)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>D9123</td><td>0</td><td>1 ($\frac{N}{16}$)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> ↑ Indicates an I/O module verification error - Not cleared even if the blown fuse is replaced with a new one. This flag is cleared by error resetting operation (refer to 11.3.).	D9116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 ($\frac{N}{16}$)	D9117	0	0	0	0	0	0	1 ($\frac{N}{16}$)	0	0	0	0	0	0	0	0	0	D9123	0	1 ($\frac{N}{16}$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S (Error)	D9116	○+Rem
D9116				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 ($\frac{N}{16}$)																																						
D9117				0	0	0	0	0	0	1 ($\frac{N}{16}$)	0	0	0	0	0	0	0	0	0																																						
D9123				0	1 ($\frac{N}{16}$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																						
SD1401				D9117																																																					
SD1402				D9118																																																					
SD1403				D9119																																																					
SD1404				D9120																																																					
SD1405				D9121																																																					
SD1406				D9122																																																					
SD1407	D9123																																																								
SD1408	New																																																								
SD1409 to SD1430	New to New																																																								
SD1431	New																																																								

(13) For redundant systems (Host system CPU information *1) for Q4AR only

SD1510 to SD1599 are only valid for redundant systems. They are all set to 0 for standalone systems.

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU D9□□□	Corresponding CPU
SD1500 SD1501	Basic period	Basic period tome	Set the basic period (1 second units) use for the process control instruction using floating point data. Floating points data = SD1501 SD1500	U	New	Q4AR
SD1502	Process control instruction detail error code	Process control instruction detail error code	Shows the detailed error contents for the error that occurred in the process control instruction	S (Error occurrence)	New	
SD1503	Process control instruction generated error location	Process control instruction generated error location	Shows the error process block that occurred in the process control instruction.	S (Error occurrence)	New	
SD1512	Operation mode during CPU start up	Hot start switch power out time	Shows the power out time (S) during the automatic switch from hot start to initial start in the operation mode when the CPU is started up.	S (Initial)	New	
SD1590	Switch request network No.	Request origin network No.	Stores the request origin at work No. when the SM1590 is turned on.	S (Error occurrence)	New	

* 1 Stores the host system CPU information.

Special Register List (Continued)

(14) For redundant systems (Other system CPU information *1) for Q4AR only

SD1600 to SD1659 is only valid during the back up mode for redundant systems, and refresh cannot be done when in the separate mode. When a standalone system SD1600 to SD1699 are all 0.

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU SD□□ * 2	Corresponding CPU
SD1600	Diagnosis error	Diagnosis error No.	- Stores as BIN code the error No. of the error that occurred during the other system CPU diagnosis. - Stores the latest error currently occurring.	S (Each END)	New	Q4AR
SD1601 SD1602 SD1603	Diagnosis error occurrence time	Diagnosis error occurrence time	- SD1600 stores the updated date and time. - Stores each of the BCD two digits. - Refer to SD1 to SD3 for the storage status. (SD1 → SD1601, SD2 → SD1602, SD3 → SD1603)	S (Each END)	New	
SD1604	Error information classification	Error information classification	- Stores the error comment information/individual information classification code. - Refer to SD4 for the storage status.	S (Each END)	New	
SD1605 SD1606 SD1607 SD1608 SD1609 SD1610 SD1611 SD1612 SD1613 SD1614 SD1615	Error common information	Error common information	- Stores the common information for the error code. - Refer to SD5 to SD15 for the storage status. (SD5 → SD1605, SD6 → SD1606, SD7 → SD1607, SD8 → SD1608, SD9 → SD1609, SD10 → SD1610, SD11 → SD1611, SD12 → SD1612, SD13 → SD1613, SD14 → SD1614, SD15 → SD1615)	S (Each END)	New	
SD1616 SD1617 SD1618 SD1619 SD1620 SD1621 SD1622 SD1623 SD1624 SD1625 SD1626	Error individual information	Error individual information	Stores the individual information for the error code Refer to SD16 to SD26 for the storage status. (SD16 → SD1616, SD17 → SD1617, SD18 → SD1618, SD19 → SD1619, SD20 → SD1620, SD21 → SD1621, SD22 → SD1622, SD23 → SD1623, SD24 → SD1624, SD25 → SD1625, SD26 → SD1626)	S (Each END)	New	
SD1650	Switch status	CPU switch status	- Stores the CPU switch status. - Refer to SD200 for the storage status. (SD1650 → SD200)	S (Each END)	New	
SD1651	LED status	CPU-LED status	- Stores the CPU's LED status. - Shows 0 when turned off, 1 when turned on, and 2 when flashing. - Refer to SD201 for the storage status. (SD1651 → SD201)	S (Each END)	New	
SD1653	CPU operation status	CPU operation status	Stores the CPU operation status. Refer to SD203 for the storage status. (SD1653 → SD203)	S (Each END)	New	

* 1 Stores other system CPU self-diagnostic information and system information.

* 2 Shows the special register (SD□□) for the host system CPU.

(15) For redundant systems (Trucking) for Q4AR only

SD1700 to SD1799 is valid only for redundant systems. These are all 0 for standalone systems.

Number	Name	Meaning	Explanation	Set by (When set)	Corresponding ACPU SD□□ * 2	Corresponding CPU
SD1700	Trucking error detection count	Trucking error detection count	Make it the trucking error detection +1.	Error occurrence	New	Q4AR

* 2 Shows the special register (SD□□) for the host system CPU.

APPENDICES

APPENDIX 1 Error Code Return to Origin During General Data Processing

The CPU module returns an error code to the general data processing request origin when an error occurs and there is a general data processing request from the peripheral equipment, intelligent function module, or network system. If an error occurs when a general data processing is requested from the peripheral devices, intelligent function module, and network system.

App.

POINT
This error code is not an error that is detected by the CPU module self-diagnostic function, so it is not stored in the special relay SD0. When the request origin is a GX Developer, a message or an error code is displayed. When the request origin is an intelligent function module or network system, an error is returned to the process that was requested.

APPENDIX 1.1 Error code overall explanation

These error codes differs depending on the error No. of the location the error was detected. The following table shows the relationship between the error detection location and the error code.

Error detection location	Error Code (hexadecimal)	Error description reference destination
CPU	4000 _H to 4FFF _H	Refer to Appendix 1.2.
Intelligent function module	7000 _H to 7FFF _H	User's manuals of intelligent function module
Network system	F000 _H to FFFF _H	Q Corresponding MELSECNET/H Network System Reference Manual

APPENDIX 1.2 Description of the errors of the error codes (4000H to 4FFFH)

The error contents of the error codes (4000H to 4FFFH) detected by the CPU module and the messages displayed by the GX Developer are shown below.

App

Error code (hexadecimal)	Error item	Error description	Countermeasure
4000H	CPU related error	Sum check error	Check the connection status of the connection cable with the CPU module
4001H		Remote request that is not handled was executed.	Check the requested remote operation.
4002H		Command for which a global request cannot be performed was executed.	Check the requested command.
4003H		CPU module cannot execute the request contents because it is in system protect	Turn off the CPU module system protect switch.
4004H		The volume of data handled according to the specified request is too large.	Reduce the volume of data to that which can be processed at the specified request.
4005H		The password cannot be deleted.	Delete the set password.
4006H		The CPU module is not BUSY (The buffer is not vacant).	After the free time has passed, reexecute the request.
4008H	CPU mode error	The CPU module is running to the request contents cannot be executed.	Execute after setting the CPU module to STOP status.
4010H		The CPU module is not in the STEP-RUN status so the request contents cannot be executed.	Execute after setting the CPU module to STEP-RUN status.
4011H			

Error code (hexadecimal)	Error item	Error description	Countermeasure
4021 _H	CPU file related error	The specified drive memory does not exist or there is an error.	Check the specified drive memory status.
4022 _H		The file with the specified file name or file No. does not exist.	Check the specified file name and file No.
4023 _H		The file name and file No. of the specified file do not match.	Delete the file and then recreate the file.
4024 _H		The specified file cannot be handled by a user.	Do not access the specified file.
4025 _H		The specified file is processing the request from a different location.	Forcefully execute the request forcibly. Or reexecute the request after the processing from the other location has ended.
4026 _H		The keyword specification set in the corresponding drive memory is required.	Access by specifying the keyword set in the corresponding drive memory.
4027 _H		The specified range exceeds the file range.	Check the specified range and access within that range.
4028 _H		The same file already exists.	Forcefully execute the request forcibly. Or reexecute after changing the file name.
4029 _H		The specified file capacity cannot be obtained.	Revise the specified file contents. Or reexecute after cleaning up and reorganizing the specified drive memory.
402B _H		The request contents cannot be executed in the specified drive memory.	Do not execute a request for a specified drive memory in which an error has occurred.
402C _H		Currently the request contents cannot be executed.	Reexecute after the free wait time has passed.
4030 _H	CPU device specified error	The specified device name cannot be handled.	Check the specified device name.
4031 _H		The specified device No. is outside the range.	Check the specified device No.
4032 _H		There is a mistake in the specified device qualification.	Check the specified device qualification method.
4033 _H		Writing cannot be done because the specified device is for system use.	Do not write the data in the specified device, and do not turn on or off.
4040 _H	Intelligent function module specification error	The request contents cannot be executed in the specified intelligent function module.	Do not conduct a request for a specified intelligent function module in which an error has occurred.
4041 _H		The access range exceeds the buffer memory range of the specified intelligent function module.	Check the header address and access number of points and access using a range that exists in the intelligent function module.
4042 _H		The specified intelligent function module cannot be accessed.	Check that the specified intelligent function module is operating normally.
4043 _H		The intelligent function module does not exist in the specified position.	Check the header I/O No. of the specified intelligent function module.
4044 _H		A control bus error has occurred.	Check that there is no error in the intelligent function module or in the hardware of another module.
4045 _H		The setting required to conduct simulation has not been made.	Conduct a simulation setting.

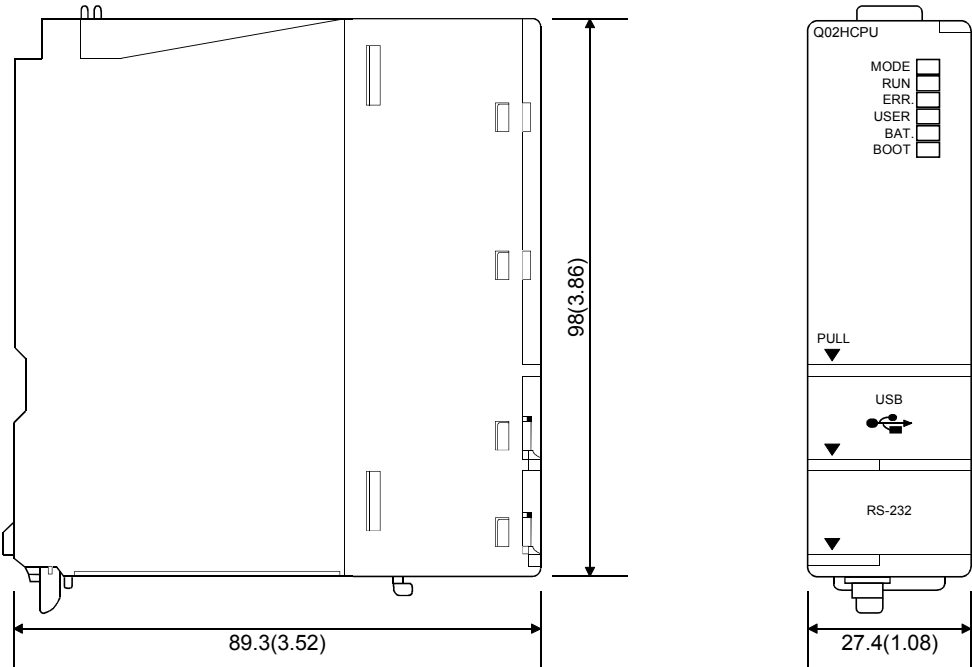
Error code (hexadecimal)	Error item	Error description	Countermeasure
4046 _H	Intelligent function module specification error	The device header or number of points in the simulation is not in 16point unit.	Check the device header No. and number of points and correct them to 16 point units.
4050 _H	Protect error	The request contents cannot be executed because the memory card write protect switch is on.	Turn off the memory card write protect switch.
4051 _H		The specified device memory cannot be accessed.	Check the following and make it countermeasures. • Is the memory one that can be used? • Is the specified drive memory correctly installed?
4052 _H		The specified file attribute is read only so the data cannot be written.	Do not write data in the specified file. Or change the file attribute.
4053 _H		An error occurred when writing data to the specified drive memory.	Check the specified drive memory. Or reexecute write after changing the corresponding drive memory.
4054 _H		An error occurred when deleting the data in the specified drive memory.	Check the specified drive memory. Or re-erase after replacing the corresponding drive memory.
4060 _H	Online registration error	The monitor condition registration CPU module system area is already being used by another piece of equipment.	Reexecute monitor after the monitor by the other equipment has completed. Or increase the system area of the program memory using the format with option.
4061 _H		Communication failed.	Execute a re-communication.
4062 _H		The monitor detail condition is already being used and monitored by another piece of equipment.	Do not conduct monitor detail conditions from the specified equipment. Or reexecute monitoring after deleting the monitor detail conditions of the other equipment.
4063 _H		The number of the file lock registrations exceeds 16.	Reduce the number of registrations to 16 or less.
4064 _H		There is a problem with the specified contents.	Check the specified contents.
4065 _H		The device allocation information differs from the parameter.	Check the parameter. Or check the data.
4066 _H		A keyword that differs from the keyword set in the specified driver memory has been specified.	Check the specified keyword.
4067 _H		The specified monitor file cannot be obtained.	Conduct monitor after obtaining the monitor file.
4068 _H		Registration/deletion cannot be conducted because the specified command is being executed.	Reexecute the command after the request from the other equipment has been completed.
4069 _H		The conditions have already been reached by the device match.	Check the monitor conditions. Or reconduct monitor registration and execute monitor.
406A _H		A drive other than Nos. 1 to 3 has been specified.	Check the specified drive and specify the correct drive.
4070 _H	Circuit inquiry	Program before correction and the registration program differ.	Check the registration program and make the programs match.
4080 _H	Other errors	Data error	Check the requested data contents.
4081 _H		The sort subject cannot be detected.	Check the data to be searched.
4082 _H		The specified command is executing and therefore cannot be executed.	Reexecute the command after the request from the other equipment is completed.
4083 _H		Trying to execute a program that is not registered in the parameter.	Register the program to be executed in the parameter.

Error code (hexadecimal)	Error item	Error description	Countermeasure
4084 _H	Other errors	The specified pointer P, I cannot be detected.	Check the data to be searched.
4085 _H		Pointer P, I cannot be specified because the program is not specified in the parameter.	Specify pointer P, I after registering the program to be executed in the parameter.
4086 _H		Pointer P, I has already been added.	Check the pointer No. to be added and make correction.
4087 _H		Trying to specify too many pointers.	Check the specified pointer and make a correction.
4088 _H		The specified step No. was not in the instruction header.	Check the specified step No. and make a correction.
4089 _H		An END instruction was inserted/deleted while the CPU module was running.	Conduct Insert/removal after the CPU module has stopped.
408A _H		The file capacity was exceeded by the write during Run.	Write the program after the CPU module has stopped.
408B _H		The remote request cannot be executed.	Reexecute after the CPU module is in a status where the mode request can be executed.
4090 _H	Online registration errors during SFC STEP-RUN	The block breakpoint number was exceeded.	Check the number of settings and make a correction.
4091 _H		There is a mistake in the block breakpoint registration number.	Check the number of registrations and make a correction.
4092 _H		The step breakpoint number has been exceeded.	Check the number of registrations and make a correction.
4093 _H		There is a mistake in the step breakpoint registration number.	Check the number of registrations and make a correction.
4094 _H		Tried to execute a request during block continuous processing.	Reconduct the request after the processing has ended.
4095 _H		Tried to execute a request during block forced execution processing.	Reconduct the request after the processing has ended.
4096 _H		Tried to execute a request during step continuous processing.	Reconduct the request after the processing has ended.
4097 _H		Tried to execute a request during step forced execution processing.	Reconduct the request after the processing has ended.
4098 _H		Tried to execute a request during one step continuous processing.	Reconduct the request after the processing has ended.
4099 _H		Tried to execute a request during one step forced execution processing.	Reconduct the request after the processing has ended.
409A _H		Tried to execute a request during block forced end processing.	Reconduct the request after the processing has ended.
409B _H		Tried to execute a request during step forced end processing.	Reconduct the request after the processing has ended.
409C _H		Tried to execute a request during hold step reset processing.	Reconduct the request after the processing has ended.
409D _H		A block No. that has not been created or that exceeds the range has been specified.	Check the setting contents and make a correction.
409E _H		A step No. that was not created was specified.	Check the setting contents and make a correction.
409F _H		The specified number of cycles is outside the range.	Check the number of registrations and make a correction.

Error code (hexadecimal)	Error item	Error description	Countermeasure
40A0 _H	SFC device specification error	A block No. outside the range was specified.	Check the setting contents and make a correction.
40A1 _H		A number of blocks that exceeds the range was specified.	Check the number of settings and make a correction.
40A2 _H		A step No. that is outside the range was specified.	Check the setting contents and make a correction.
40A3 _H		A number of steps that exceeds the range was specified.	Check the number of settings and make a correction.
40A4 _H		A sequence step No. outside the range was specified.	Check the setting contents and make a correction.
40A5 _H		The specified device was outside the range.	Check the number of settings and make a correction.
40A6 _H		There is a mistake in the block specification pattern or the step specification pattern.	Check the setting contents and make a correction.
40B0 _H	SFC file related error	The wrong drive was specified.	Check the setting contents and make a correction.
40B1 _H		The specified program does not exist.	Check the specified file name and make a correction.
40B2 _H		The specified program was not an SFC program.	Check the specified file name and make a correction.
40B3 _H		There was an SFC dedicated instruction in the write during run area.	Check the setting contents and make a correction.
41D0 _H	File-related errors	The route directory has no free space.	Increase the free space of the specified drive. Optimize the specified drive to increase continuous free areas.
41D1 _H		The file pointer is insufficient.	Specify the correct file pointer.
41D5 _H		The file of the same name exists.	Change the file name.
41DF _H		The disk is write-protected.	Cancel the write protection of the disk and execute again.
41E0 _H		The drive does not respond.	Check for the specified drive. If it exists, check its status.
41E1 _H		The address or sector is not found.	Check if the target is a ROM drive or not.
41E4 _H		The file cannot be accessed properly.	Execute again after resetting the CPU.
41E8 _H		The drive format information is illegal.	Format the target drive once.
41E9 _H		At the time of file access, time-out occurred during waiting for access.	Execute again after some time.
41EB _H		The path name is too long.	Check the length of the path name.
41EC _H		The disk is logically broken.	Change the specified drive.
41ED _H		An attempt to make a file continuous failed. (There are enough free file areas, which cannot be taken continuously.)	Optimize the specified drive to increase continuous free areas.
41F2 _H		The specified drive is ROM.	Check the specified drive. (Format it for RAM.)
41FB _H		The same starting source has already opened the specified file.	Check if it is being processed by another application.
41FC _H		An attempt was made to erase the mounted drive.	Execute again after dismounting the drive.
41FD _H		The flash ROM is not formatted.	Erase the specified drive.
41FE _H		The IC memory card is not inserted.	Insert or reinsert the IC memory card.
41FF		The IC memory card type differs.	Check the IC memory card type.
4A00 _H	Link related error	The specified station could not be accessed because a routing parameter was not set in the related station.	Set the routing parameter for accessing the specified station in the related station.
4A01 _H		The network with the No. set in the routing parameter does not exist.	Check the routing parameter set in the related station and make a correction.
4A02 _H		Cannot access the specified station.	Check if an error has occurred in the network module and if the module is offline.
4B00 _H	Object related error	An error occurred in the access destination or in a relay station.	Check if an error has occurred in the specified access destination or in a relay station to the access station and if so take countermeasures.

APPENDIX 2 External Dimensions Diagram

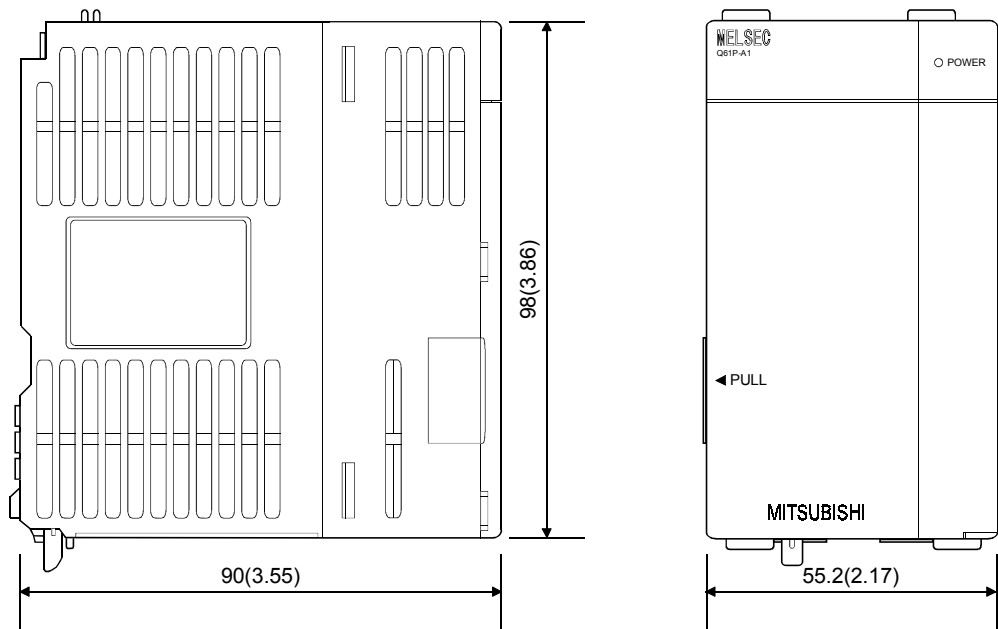
APPENDIX 2.1 CPU module



Unit: mm (inch)

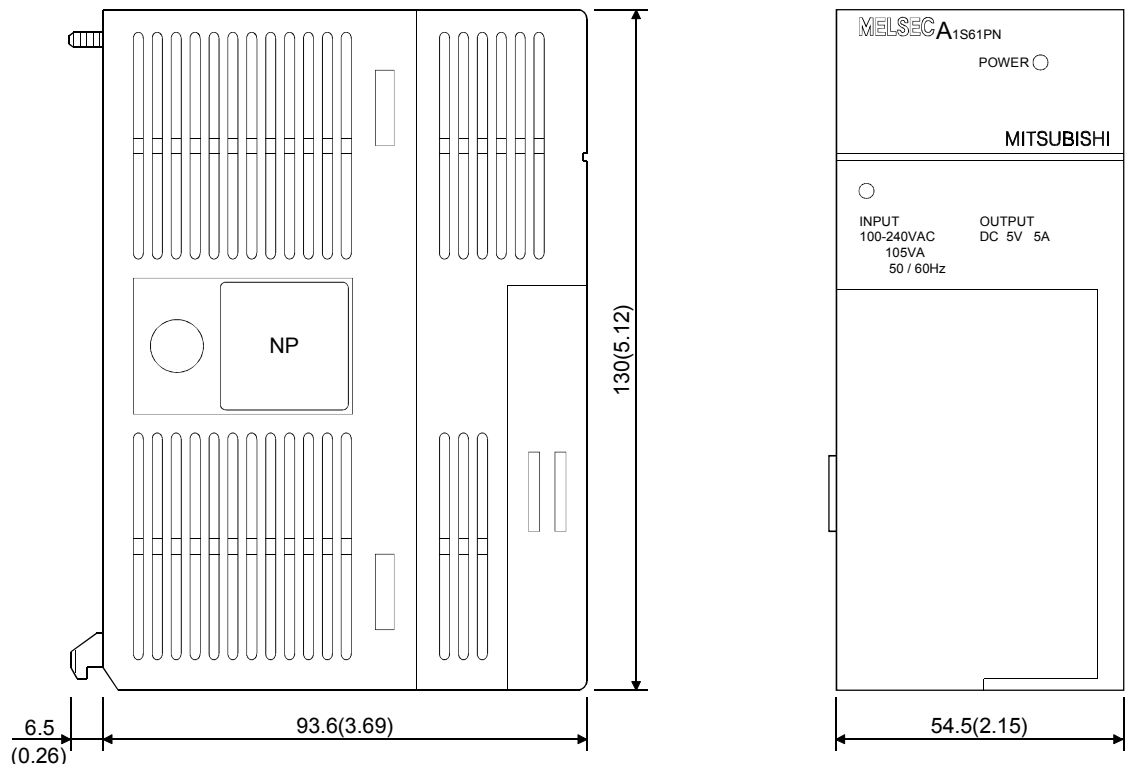
APPENDIX 2.2 Power supply module

(1) Power Supply Module (Q61P-A1, Q61P-A2, Q62P, Q63P)



Unit: mm (inch)

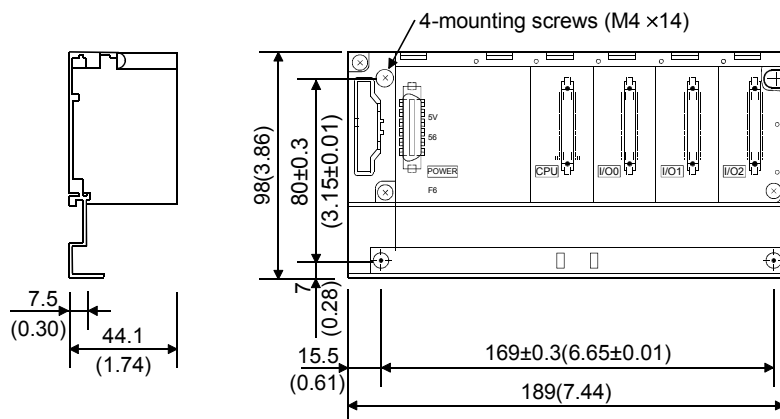
(2) Power Supply Module (A1S61PN, A1S62PN, A1S63P)



Unit: mm (inch)

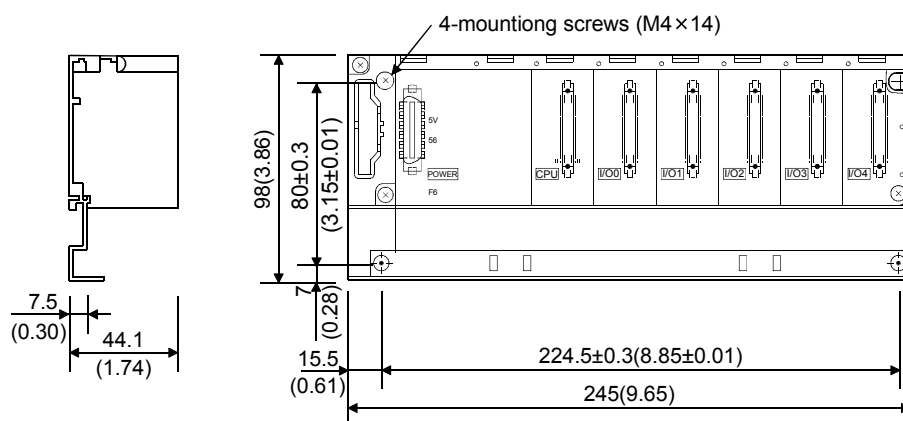
APPENDIX 2.3 Main base unit

(1) Main Base Unit (Q33B)



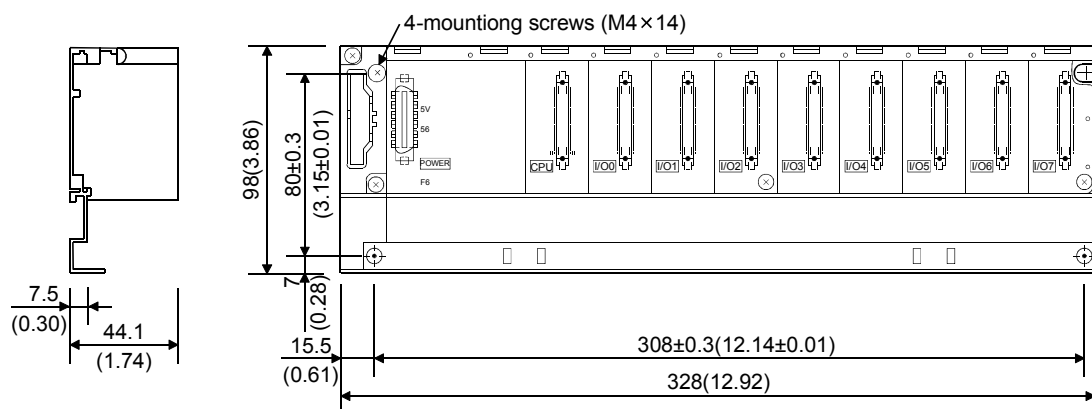
Unit: mm (inch)

(2) Main Base Unit (Q35B)



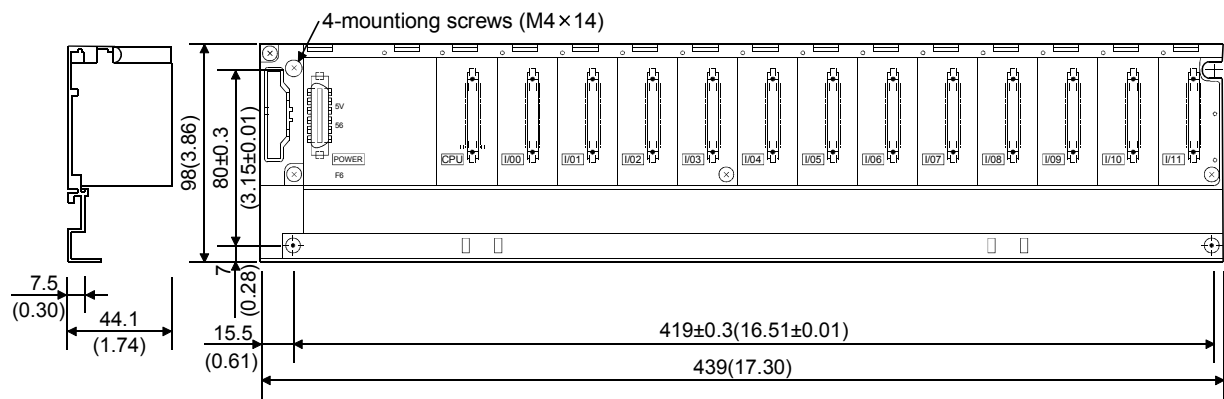
Unit: mm (inch)

(3) Main Base Unit (Q38B)



Unit: mm (inch)

(4) Main Base Unit (Q312B)

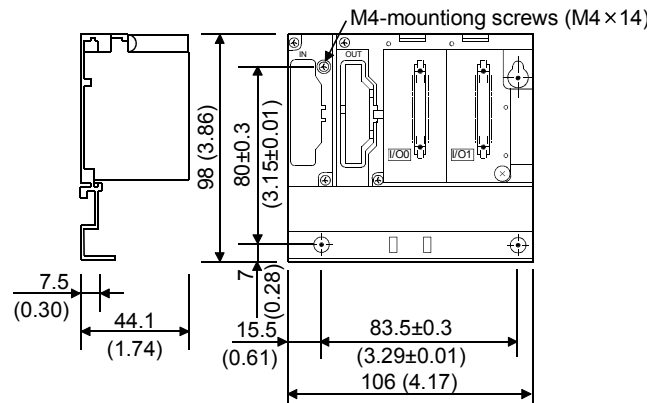


Unit: mm (inch)

APPENDIX 2.4 Extension base unit

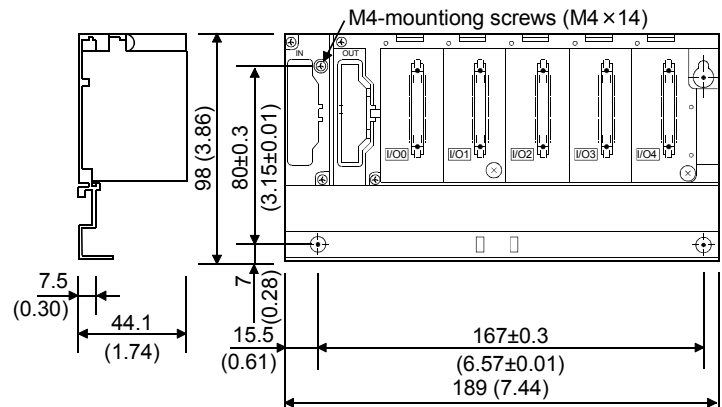
Unit: mm (inch)

(1) Extension Base Unit (Q52B)



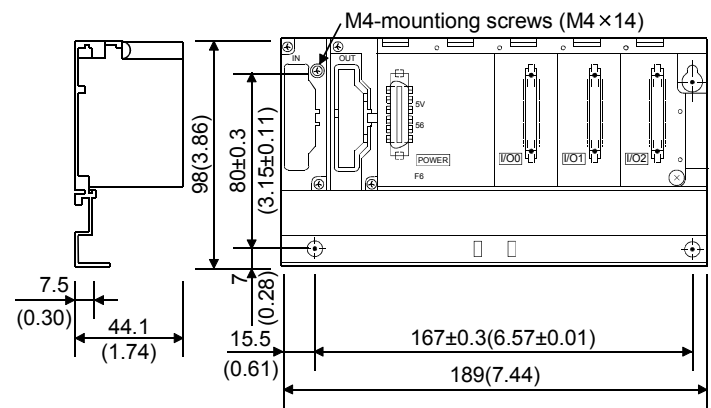
Unit: mm (inch)

(2) Extension Base Unit (Q55B)



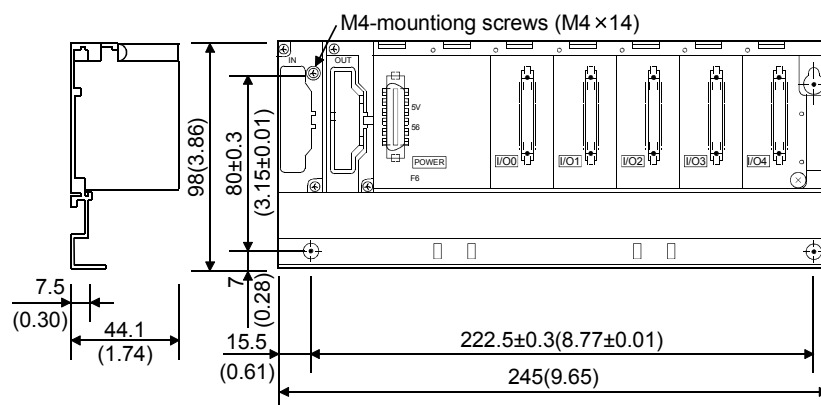
Unit: mm (inch)

(3) Extension Base Unit (Q63B)



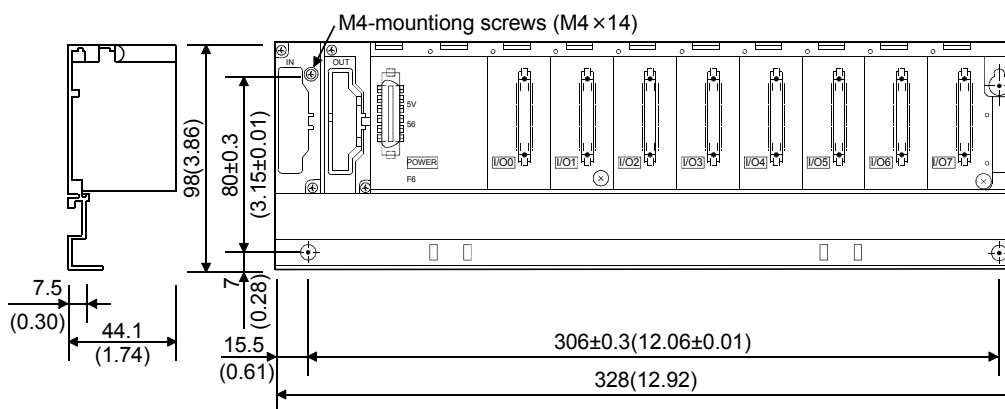
Unit: mm (inch)

(4) Extension Base Unit (Q65B)



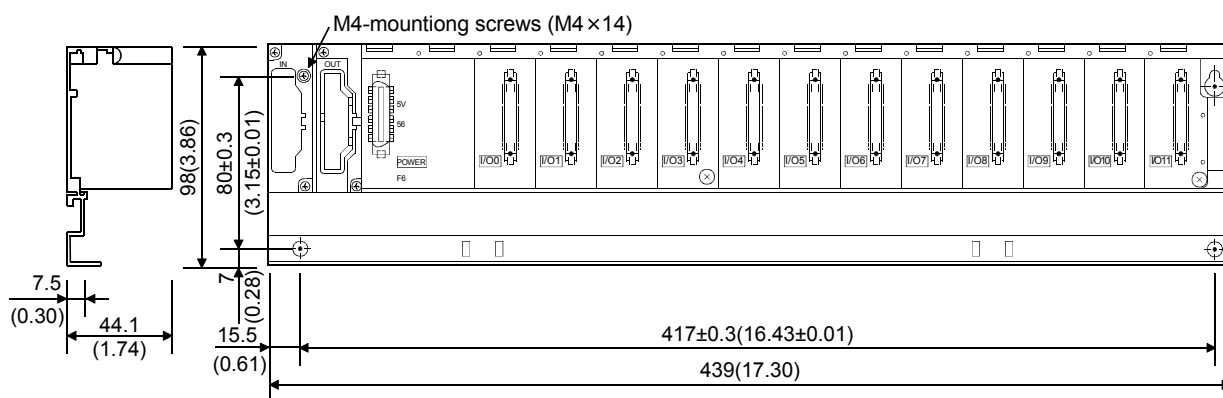
Unit: mm (inch)

(5) Extension Base Unit (Q68B)



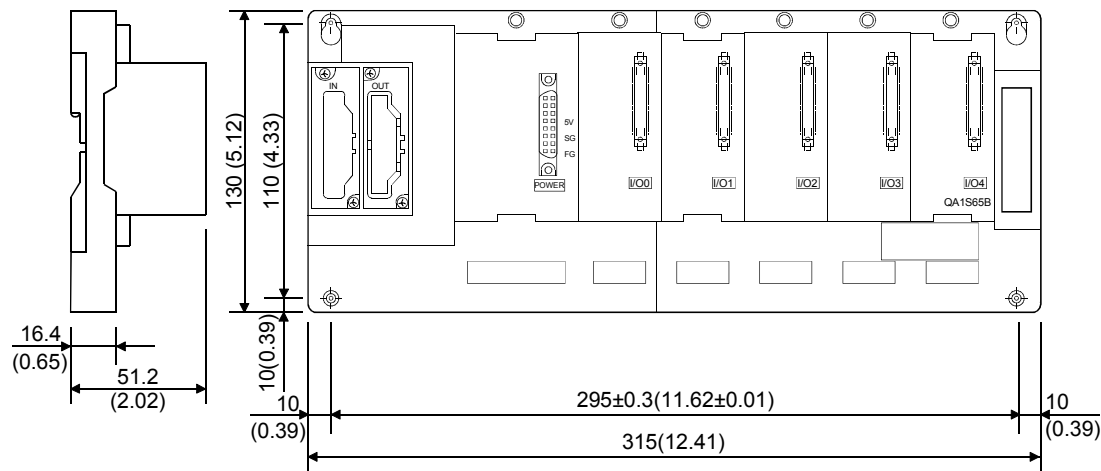
Unit: mm (inch)

(6) Extension Base Unit (Q612B)



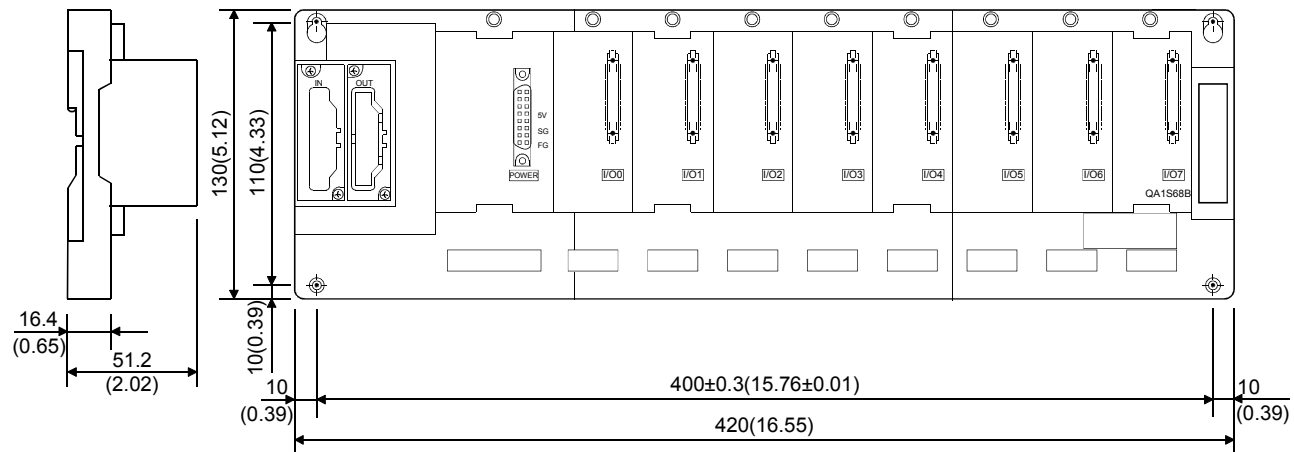
Unit: mm (inch)

(7) Extension Base Unit (QA1S65B)



Unit: mm (inch)

(8) Extension Base Unit (QA1S68B)



Unit: mm (inch)

INDEX

- [A]
 Allowable momentary stop time..... 4- 3
 AnS Series.....A-12
- [B]
 Base unit
 Extension 2- 3, 6- 5, 6- 6
 External dimensions diagram.....App- 9 to App-13
 Installation and removal
 of the module 9-14 to 9-17
 Installation dimensions 9-12
 Installation direction 9-13
 Installation position 9-12
 Names of parts 6- 3
 Specifications..... 6- 1
 Battery
 Installation 7- 6
 Replacement procedure
 (CPU module) 10- 6
 Replacement procedure
 (SRAM card) 10- 7
 Replacement standard 10- 5
 Boot operation 4- 7,11-13
- [C]
 Circuit
 Fail-safe 9- 5
 System design 9- 3,9- 4
 Clock function 4- 3
 Constant scan..... 4- 1
 Control method 4- 1
 CPU
 Installation and removal 9-14
 Performance 4- 1
- [D]
 DIN rail
 ~ installation adapter 9-11
 Applicable 9-11
 Intervals of ~ installation screws 9-11
- [E]
 Extension
 Base unit 6- 1
- Cable 6- 2
 Stage 2- 3,6- 5
- External dimensions
 CPU 4- 3
 Base unit.....6- 1
 Power supply module.....5- 2
- [G]
 GX Developer A-12
- [H]
 High Performance model QCPU A-12,1- 1
- [I]
 I/O control method 4- 1
 Installation and removal 9- 9
 Intelligent function module
 Direct device.....4- 3
 Limit 2- 4
 Internal current consumption 4- 3
- [L]
 Latch range 4- 3
 LED
 "BAT. ALARM" ~ is turned on.....11- 7
 "ERR." ~ is turned on/flashing. 11- 6
 "POWER" ~ is turned off.....11- 3
 "RUN" ~ is turned off/flashing. 11- 5
 "USER" ~ is turned on.....11- 7
 Names 4- 4
 Limit 2- 4
 Link direct device 4- 3
- [M]
 Maximum number of extension stages 2- 3
 Memory
 Capacity.....4- 1
 Card 7- 1
- [N]
 Number of device points 4- 2
 Number of I/O points.....4- 1
- [P]
 Performance.....4- 1

Power supply module	
External dimensions diagram.....	App- 8
Example of wiring	9-26
Installation.....	9-14
Names of parts and settings	5- 6
Specifications.....	5- 1
Wiring.....	9-23
Processing speed.....	4- 1
Programming language.....	4- 1

[Q]

Q Series.....	A-12
---------------	------

[R]

Remote RUN/PAUSE contact	4- 3
--------------------------------	------

[S]

Specifications	
Base unit.....	6- 1
Battery.....	7- 2
CPU.....	4- 1
Extension cable	6- 2
General	3- 1
Memory card.....	7- 1
Power supply module	5- 1
System configuration	
Configured equipment.....	2- 1
Outline.....	2- 3
Peripheral device.....	2- 2

[T]

Tightening torque of screw.....	9- 9
Total number of instructions.....	4- 1

[W]

Weight	
Base unit.....	6- 1
Battery.....	7- 2
CPU.....	4- 3
Extension cable	6- 2
Memory card.....	7- 1
Power supply module	5- 2
Wiring	
Extension cable	2- 3
Heat generation	9- 6
I/O module	9-25
Power supply module	9-23,9-26
Wiring of the I/O module.....	9-25

WARRANTY

Please confirm the following product warranty details before starting use.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the dealer or Mitsubishi Service Company. Note that if repairs are required at a site overseas, on a detached island or remote place, expenses to dispatch an engineer shall be charged for.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 7. Any other failure found not to be the responsibility of Mitsubishi or the user.

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not possible after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses, lost profits incurred to the user by Failures of Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, and compensation for damages to products other than Mitsubishi products and other duties.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

- (1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
- (2) The Mitsubishi general-purpose programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or National Defense purposes shall be excluded from the programmable logic controller applications.

Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application shall be possible.

When considering use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected and for which a particularly high reliability is required in terms of safety and control system, please consult with Mitsubishi and discuss the required specifications.

HEADQUARTERS

MITSUBISHI ELECTRIC EUROPE B.V.
German Branch
Gothaer Straße 8
D-40880 Ratingen
Phone: +49 (0) 21 02 / 486-0
Fax: +49 (0) 21 02 / 486-1 12
e mail: megfamail@meg.mee.com

MITSUBISHI ELECTRIC EUROPE B.V.
French Branch
25, Boulevard des Bouvets
F-92741 Nanterre Cedex
Phone: +33 1 55 68 55 68
Fax: +33 1 49 01 07 25
e mail: factory.automation@fra.mee.com

MITSUBISHI ELECTRIC EUROPE B.V.
Italian Branch
Via Paracelso 12
I-20041 Agrate Brianza (MI)
Phone: +39 039 6053 1
Fax: +39 039 6053 312
e mail: factory.automation@it.mee.com

MITSUBISHI ELECTRIC EUROPE B.V.
Spanish Branch
Carretera de Rubí 76-80
E-08190 Sant Cugat del Vallés
Phone: +34 9 3 / 565 3131
Fax: +34 9 3 / 589 2948
e mail: industrial@sp.mee.com

MITSUBISHI ELECTRIC EUROPE B.V.
UK Branch
Travellers Lane
GB-Hatfield Herts. AL10 8 XB
Phone: +44 (0) 1707 / 27 61 00
Fax: +44 (0) 1707 / 27 86 95

MITSUBISHI ELECTRIC CORPORATION
Office Tower "Z" 14 F
8-12,1 chome, Harumi Chuo-Ku
Tokyo 104-6212
Phone: +81 3 / 622 160 60
Fax: +81 3 / 622 160 75

MITSUBISHI ELECTRIC AUTOMATION
500 Corporate Woods Parkway
Vernon Hills, IL 60061
Phone: +1 847 / 478 21 00
Fax: +1 847 / 478 22 83

EUROPEAN REPRESENTATIVES

GEVA GmbH
Wiener Straße 89
A-2500 Baden
Phone: +43 (0) 2252 / 85 55 20
Fax: +43 (0) 2252 / 488 60
e mail: office@geva.co.at

Getronics bv
Control Systems
Pontbeeklaan 43
B-1731 Asse-Zellik
Telefon: +32 (0) 2 / 467 17 51
Telefax: +32 (0) 2 / 467 17 45
E-Mail: infoautomation@getronics.com

TELECON CO.
4, A. Ljapchev Blvd.
BG-1756 Sofia
Phone: +359 92 / 97 44 05 8
Fax: +359 92 / 97 44 06 1
e mail: —

INEA CR d.o.o.
Drvinje bb
HR-10000 Zagreb
Phone: +385 (0) 1 / 366 71 40
Fax: +385 (0) 1 / 366 71 40
e mail: inea-cr@zg.tel.hr

AutoCont Control Systems s.r.o.
Nemocnicni 12
CZ-702 00 Ostrava 2
Phone: +420 (0) 69 / 615 21 11
Fax: +420 (0) 69 / 615 21 12
e mail: petr.pustovka@autocont.cz

louis poulsen
Geminivej 32
DK-2670 Greve
Phone: +45 (0) 43 / 95 95 95
Fax: +45 (0) 43 / 95 95 91
e mail: lpia@lpmail.com

UTU Elektrotehnika AS
Pärnu mnt.160i
EE-11317 Tallinn
Phone: +372 6 / 51 72 80
Fax: +372 6 / 51 72 88
e mail: utu@utu.ee

Beijer Electronics OY
Elannontie 5
FIN-01510 Vantaa
Phone: +358 (0) 9 / 615 20 11
Fax: +358 (0) 9 / 615 20 500
e mail: info@elc.beijer.fi

MITSUBISHI ELECTRIC EUROPE B.V. – Irish Branch
Westgate Business Park
IRL-Dublin 24
Phone: +353 (0) 1 / 419 88 00
Fax: +353 (0) 1 / 419 88 90
e mail: sales.info@meuk.mee.com

EUROPEAN REPRESENTATIVES

Getronics bv
Control Systems
Donauweg 2B
NL-1043 AJ Amsterdam
Phone: +31 (0) 20 / 587 68 30
Fax: +31 (0) 20 / 587 68 39
e mail: info.gia@getronics.com

Beijer Electronics A/S
Teglverksveien 1
N-3002 Drammen
Phone: +47 (0) 32 / 24 30 00
Fax: +47 (0) 32 / 84 85 77
e mail: info@elc.beijer.no

MPL Technology SP. z.o.o
ul. Wroclawska 53
PL-30011 Kraków
Phone: +48 (0) 12 / 632 28 85
Fax: +48 (0) 12 / 632 47 82
e mail: mpl@krakow.ipl.net

Sirius Trading & Services srl
Bd. Ghica nr. 112, Bl. 41, Sc.2, ap. 98
RO-72235 Bucuresti 2
Phone: +40 (0) 1 / 210 55 11
Fax: +40 (0) 1 / 210 55 11
e mail: sirius_t_s@fx.ro

ACP AUTOCOMP a.s.
Chalupkova 7
SK-81109 Bratislava
Phone: +421 (0) 7 592 22 48
Fax: +421 (0) 7 592 22 54
e mail: acp.autocomp@nextra.sk

INEA d.o.o.
Ljubljanska 80
SI-1230 Domžale
Phone: +386 (0) 1 / 721 80 00
Fax: +386 (0) 1 / 724 16 72
e mail: inea@inea.si

Beijer Electronics AB
Box 325
S-20123 Malmö
Phone: +46 (0) 40 / 35 86 00
Fax: +46 (0) 40 / 93 23 01
e mail: info@elc.beijer.se

ECONOTEC AG
Postfach 282
CH-8309 Nürensdorf
Phone: +41 (0) 1 / 838 48 11
Fax: +41 (0) 1 / 838 48 12
e mail: info@econotec.ch

GTS
Darülaceze Cad. No. 43A KAT: 2
TR-80270 Okmeydani-Istanbul
Phone: +90 (0) 212 / 320 1640
Fax: +90 (0) 212 / 320 1649
e mail: gts@turk.net

MIDDLE EAST REPRESENTATIVE

TEXEL Electronics LTD.
Rehov Hamerkava 19
IL-42160 Netanya
Phone: +972 (0) 9 / 863 08 91
Fax: +972 (0) 9 / 885 24 30
e mail: texel_me@netvision.net.il

EURASIAN REPRESENTATIVES

MITSUBISHI ELECTRIC EUROPE B.V.
Moscow Representative Office
52 Kosmodamianskaya Nab., bld. 5
RUS-113054 Moscow
Phone: +7 (0) 95 / 721 2070
Fax: +7 (0) 95 / 721 2071
e mail: info@mitsubishi-electric.ru

NPP Uralelektra
Sverdlova 11A
RUS-620027 Ekaterinburg
Phone: +7 34 32 / 53 27 45
Fax: +7 34 32 / 53 24 61
e mail: elektra@etel.ru

JV-CSC Automation
15, Marina Raskovoyi St.
U-02002 Kiev
Phone: +380 (44) / 238 83 16
Fax: +380 (44) / 238 83 17
e mail: mkl@csc-a.kiev.ua

AFRICAN REPRESENTATIVE

Circuit Breaker Industries Ltd.
Private Bag 2016
ZAF-1600 Isando
Phone: +2711 928 2000
Fax: +2711 392 2354

